SPIRITUALITY, HEALTH LOCUS OF CONTROL, AND WELLNESS IN ORGANIZATIONAL HEALTH PROMOTION AND WELLNESS PROGRAMS

Janine E. Gauthier, M.A.

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August, 2001

APPROVED:

Warren Watson, Major Professor
Robert Kaman, Minor Professor
Genie Bodenhamer-Davis, Committee Member
Paul Lambert, Committee Member
Warren Burggren, Dean of the College of Arts and Sciences
C. Neal Tate, Dean of the Robert B. Toulouse School of Graduate Studies

Gauthier, Janine E., Spirituality, health locus of control, and wellness in organizational health promotion and wellness programs. Doctor of Philosophy (Clinical Health Psychology), August, 2001, 74 pp., 17 tables, references, 110 titles.

The relationship between an individual's level of spirituality, health locus of control, and participating in wellness activity was investigated. The relationship between spirituality, health locus of control on physical health was also investigated. The research question was based on prior studies that reported people who are more spiritual are healthier. Does their spirituality lead to increased levels of health, or are individual's who are more spiritual more likely to proactively take control of their health and engage in health promoting behaviors? One hundred and fifteen male and female employees completed The Spiritual Involvement and Beliefs Scale (SIBS), a spirituality measure, The Multidimensional Health Locus of Control Scale, a measure of locus of control related to health and healthcare, and The Center for Disease Control's (CDC) Health Risk Appraisal, a self-report measure of participation in health behaviors. Physical measures of health were obtained by obtaining Body Mass Index, blood pressure readings, and a cholesterol screening. The current study looked at level of spirituality (internal, external), level of health locus of control (internal, powerful other, chance) and participation in wellness/health promoting behaviors and health. Correlational analyses were performed on the relationship between spirituality and health locus of control. Hierarchical multiple regressions were performed on the internal spirituality and internal health locus of control to examine the relationship between spirituality, health locus of control and positive health behaviors and level of physical health. Stepwise discriminant function analysis using spirituality and health locus of control as predictor variables for the health-behavior

criterion variables were performed. Discussion of the results, limitations of the current study and recommendations for future research were presented.

ACKNOWLEDGMENTS

There are a number of individuals I would like to thank for all their support and guidance as I worked to complete this project. I would like to express my appreciation to Dr. Warren Watson, my dissertation chair, for his time and his encouragement as I engaged in the task of designing and completing this endeavor. His encouragement and support provided the impetus to see this project through. I have learned a great deal as a result of working in collaboration with Dr. Watson.

I would like to express my thanks to Dr. Robert Kaman, Dr. Genie Bodenhamer-Davis, and Dr. Paul Lambert, members of my committee, for participating on this project. They provided beneficial guidance and support via thoughtful questions and ideas as I embarked on this research project. I am appreciative of their unending feedback and flexibility, which helped me to complete this project.

Finally, I would like to express sincere thanks to Norm O'Rourke, a fellow colleague, for providing editorial and stylistic feedback and suggestions on the many revisions of this document. His willingness to offer his time and energy on the less glamorous aspects of this project made the completion of this dissertation more manageable.

TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS iii

LIST OF TABLES v

Chapter

1. INTRODUCTION/ REVIEW OF LITERATURE 1

   Statement of the Problem
   Definition of Terms
   Review of Literature

2. RATIONALE AND HYPOTHESIS 30

3. METHOD 34

4. RESULTS 42

5. DISCUSSION 59

APPENDIX 93

REFERENCE LIST 105

LIST OF TABLES

Table Page

1. Descriptive features of study measures....73

2. Factor loadings from principal components analysis: Communalities, eigenvalues, and percentages of variances....74

3. Intercorrelations for gender, age, health locus of control, spirituality, health, and health behavior variables....75

4. Hierarchical regression analysis summary for spirituality and health locus of control predicting amount of alcohol consumed....77

5. Hierarchical regression analysis summary for spirituality and health locus of control predicting amount of alcohol consumed....78

6. Means and standard deviations of predictor variables as a function of physical activity level....79

7. Predictor variables in stepwise discriminant function analysis for eating high cholesterol foods....80

8. Predictor variables in stepwise discriminant function analysis for overall health rating....81

9. Hierarchical regression analysis summary for spirituality and health locus of control predicting amount of alcohol consumed....82

10. Hierarchical regression analysis summary for spirituality and health locus of control predicting body mass index (BMI)....83

11. Hierarchical regression analysis summary for spirituality and health locus of control predicting total cholesterol level....84

12. Hierarchical regression analysis summary for spirituality and health locus of control predicting triglyceride level....85

13. Means and standard deviations of predictor variables as a function of blood pressure group....86

LIST OF TABLES

LIST OF TABLES

Table Page

14. Predictor variables in stepwise discriminant function analysis for blood pressure group 87

15. Means and standard deviations of predictor variables as a function of physical activity level. 88

16. Predictor variables in stepwise discriminant function analysis for eating high cholesterol foods 89

17. Predictor variables in stepwise discriminant function analysis for overall health rating 90

CHAPTER ONE

REVIEW OF LITERATURE

Statement of the Problem

The focus of the study was to assess individual levels of spirituality, health locus of control, and participation in wellness/health related behaviors. Additionally, actual physical health was measured by collecting blood pressure and cholesterol screening (lipid profile including HDL, LDL, tryglycerides, and lipid risk ratios). The study was conducted with employees at an organization with a health promotion program currently established.

There is currently an established link between religiosity and health (Ellison, 1988; Hixson, Gruchow, & Morgan, 1998; Koenig, George, & Peterson, 1998; Levin, 2001; Sloan, Bagiella, & Powell, 1999; Strawburg, Cohen, Shema, & Kaplan, 1997) as well as a link between spirituality and health (Kass, Friedman, Leserman, Zuttermeister, & Benson, 1991; McBride, Arthur, Brooks, and Pilkington, 1998; Waite, Hawks, & Gast, 1999;). Additionally, the research suggests a positive relationship between health locus of control and participation in health related behavior (Carlson & Petti, 1989). Participating in positive health behaviors will likely result in positive health benefits for individuals. Empirically evaluating the relationship between spirituality, health locus of control and participation in health/wellness behaviors is currently limited.

Definition of Terms

Wellness – An active process of becoming aware of and making choices toward a more successful existence, which encompasses the entire spectrum of an individual's life (National Wellness Association).

Internal Health Locus of Control – A perspective where individuals are more likely to actively participate in their health and health care.

Powerful Others Health Locus of Control – A perspective where individuals are more likely to rely on the medical professionals to take care of their health.

Chance Health Locus of Control – A perspective where individuals perceive they have no control over their health and believe it is fate if they get sick or stay healthy.

Religiosity – "Adherence to the beliefs and practices (rituals) of an organized church or religious institutions" (Shafranske & Maloney, 1990, p 72)

Intrinsic Religiosity – Way of being religious that regards faith as a supreme value in its own right; the person finds motivation and meaning for life in their religion.

Extrinsic Religiosity – Way of being religious where the individual is motivated externally and tends to "use religion" (Allport & Ross, 1967).

Spiritual – "of the spirit or the soul, of or consisting of spirit; not corporeal, religious, sacred" (Webster's, 1983).

Spirituality – "consists of all the beliefs and activities by which individuals attempt to relate their lives to God or to a divine being or some other conception of a transcendent reality."

Introduction

"Wellness" is a popular "buzzword" within the current trend to a healthy lifestyle and the emphasis on healthy behaviors. Wellness describes choices individuals make regarding diet, exercise, preventative health care, and spiritual well being. Dimensions of wellness have been defined as behaviors relevant to one's health including nutritional awareness, stress management, physical fitness, self-responsibility, and environmental sensitivity (Ardell, 1977). Wellness encompasses the entire spectrum of an individual's life, home, work, relationships, and approach to being in the world. Ryan and Travis (1981) developed the "wellness index" to evaluate an individual's level of wellness behavior in twelve separate areas including eating behavior, working and playing, and communicating. Similarly the National Wellness Association defines wellness as "an active process of becoming aware of and making choices toward a more successful existence (http://wellnessnwi.org/nwa/naweldef.html)."

Wellness behaviors

Health has been measured in terms of physical health including diet, weight, exercise, blood pressure, and cholesterol levels, in addition to the absence of disease. Health was defined by the World Health Organization (1946) as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. "Spirituality" has recently been defined as a term pertaining to one’s meaning and purpose in life (Ardell, 1996; Steinhardt, 1994) and, is an elusive issue lying at the heart of a well-managed lifestyle. Leaving spirituality out of wellness and wellness

programming is compared to eliminating important nutrients in your diet (Ardell, 1986 cited in Fahlberg & Fahlberg, 1991).

Work-site wellness programs

Wellness programming in the corporate community has existed for at least 30 years (Haughie, 1993) and more than two thirds of the United States businesses with 50 or more employees have some form of health promotion programming (Bailey, 1990; Haughie, 1993). Companies previously provided such services as medical benefits, workers compensation, and employee assistance programs at the work-site to manage their employee's health (Hollenbeck, Gerhart, & Wright, 1997). These services activated when employees became ill. Employee wellness programs were designed to prevent illness (Hollenbeck, Gerhart & Wright).

Workplace wellness programs have steadily increased in popularity over the last 30 years. Initially, these programs consisted primarily of fitness programs for employees. However, over the last ten years medical/health costs for employees have increased dramatically. In fact, the national average cost per employee was $968 in 1980, $1740 in 1985, and $3250 in 1990 (Harvey, Whitmer, Hilyer, & Brown, 1993). Consequently, wellness programs have evolved to include a variety of non-fitness related activities.

Health costs go beyond the medical benefits paid by a company. Health experts (Campbell, 1995) calculate the "real cost" of poor employee health is close to $10,000 per employee household per year. These costs consist of worker absenteeism costs, loss of employees due to catastrophic health conditions, and low productivity due to chronic fatigue, pain or high stress levels (Campbell). Employers are beginning to address these

rising health care costs. Employers have found implementing health education and screening programs is more cost effective than treating employees who develop a disease due to membership in a "high risk" group (McAllister & Broeder, 1993). Employees considered part of a "high risk" group include those employees who engage in unhealthy behaviors such as smoking, drug use, and poor diet (Http://www.health-net.com, 1996).

Employee wellness programs focus on changing behaviors both at and away from the work-site that may eventually lead to health problems (Hollenbeck, Gerhart, & Wright, 1997). These programs have begun to specialize in and function as preventative activities that attempt to manage health care costs by decreasing employees' needs for services. These wellness programs set goals and provide small, symbolic rewards to individuals who meet their goals. For example, the City of Birmingham, Alabama's comprehensive medical benefits cost management program that was initiated to address the rising costs of medical benefits expenses (Harvey et al., 1993). After five years the average amount spent per employee dropped from $400 above the state average per employee to $922 below the state average.

Corporations' costs increase when employees' productivity declines due to illness and absenteeism. Therefore, reducing employee time off for illness would increase company productivity, which would increase financial gains. Individuals who participate in wellness behaviors (healthy eating, exercising, stress management, and ergonomically appropriate behavior when engaging in physically demanding work) typically are healthier overall and therefore take less time off from work for illness (Gebhart & Crump, 1983; McAllister & Broeder, 1993). Measuring cost differences in absenteeism

for individuals in "high risk" groups (smokers, overweight, abuse alcohol, elevated blood pressure and/or cholesterol levels), DuPont found total cost before implementing a wellness program for these employees was conservatively estimated at $70.8 million annually (Naas, 1992). Dupont's' health and wellness manager reported the health promotion program would pay for itself if excess illness days were reduced by 13.8%. Interestingly, two years after the wellness program was initiated DuPont found the level of absenteeism in those classified as "blue collar" workers declined by 14% at sites with the wellness programming and fell only 5.8% at sites that had not instituted wellness programs (Naas).

Corporations implementing these programs began to note the cost-benefit of these programs. Many companies that implemented wellness programs for their employees found for every dollar spent developing and maintaining wellness programs for their employees they saved from $2.00 - $6.00 dollars (Http://www.awhp.com, 1998). For example, Coors had a $6.15 return on the dollar for their investment in wellness programming while Bank of America netted a $6.00 return. Daley and Parfitt (1996) show that participation in wellness programs has a positive impact on not only employees' level of absenteeism but also suggests overall mood state is improved along with physical well being and job satisfaction.

Goals for workplace wellness programming include promoting employee understanding of the benefits of a healthy lifestyle, providing employees with means of assessing their own lifestyles and current health status, and providing employees with opportunities to improve their health by changing lifestyles and health habits (McAllister

& Broeder, 1993). Corporations are highly motivated to invest in developing wellness programs for a number of cost-effective reasons. First, wellness programs have been shown to increase employee morale and job performance (Cox, Shephard, & Corey, 1981). Second, effective wellness programs typically result in a decrease in lost productivity from absenteeism, number of reported illnesses (Glasgow & Terborg, 1988; Lynch, Golaszewski, Clearie, Snow, & Vickery, 1990) and injury rates (Tenneco, 1988). Finally, company health care expenses are lowered due to a decrease in medical claims submitted (Gebhardt & Crump, 1990).

Spirituality

Spiritual health is linked to the ancient Greeks, who 2000 years ago viewed an individual's well being "as an integration of the relationship between body, mind, and soul" (Seidl, 1993 pg. 49). The Hebrews defined the body, mind, and soul elements as material, relational, and transcendent (Seidl). Spirituality is often an included component in wellness models. Steinhardt's (1994) health perspective presented the concept of health as a circular model. According to Steinhardt, health previously was defined in terms of external measurable indicators such as weight, blood pressure, cholesterol, and physical fitness. This particular model included the individual's "physical resilience" component (Steinhardt) as well as five other components including a spiritual life purpose. Spiritual life purpose is defined as a positive sense of meaning and purpose in life. The National Interfaith Coalition on Aging (1975, cited in Michello, 1988) defines spirituality and spiritual well-being as "an affirmation of life in a relationship with God, self, community, and environment that nurtures and celebrates wholeness.

Definition of spirituality

Interest in spirituality has increased over the past twenty years. Many differing views exist about how to operationally define spirituality, how to identify an individual possessing spiritual characteristics, and how spirituality is expressed. Webster's dictionary (Guralnik, 1984) defines "spiritual" as "of the spirit or the soul, of or consisting of spirit; not corporeal, and religious; sacred." Spirituality, according to Levin (2001, p 10), has taken on new meaning including practices such as “meditation and secular transcendent experiences” making it a broader phenomenon where religion is subsumed as a subset of spirituality. His definition of spirituality consists of all references pertaining to the domain of life beyond the body and mind (Levin, 2001).

The Westernized mainstream medical field has viewed spirituality as an erroneous and deceptive practice, which provides minimal use in health as it has no basis in science (Larson, Wood, & Larson, 1993). This current lack of attention given to the spiritual dimension is paradoxical as western medicine originated within spiritual institutions (Hiatt, 1986) and has several common links. Allopathic medicine is skeptical of the viability of the spirituality or the spiritual nature of their patients. However, patients diagnosed with a terminal illness or experiencing medical crises desire more than a "cure" for their physical bodies (Levin, 1993). These patients must cope with the isolation and desperation of their situation and oftentimes turn toward more spiritual venues (Aldridge, 1993 cited in Larson, Wood, & Larson).

Spirituality as a viable factor in healthcare, health education, and health promotion has experienced an increasing level of importance. Larson, Wood, and Larson (1993)

suggested the effects of spirituality "can be and have been empirically studied." Levin (1993) suggests that exoteric and naturalistic explanations exist which provide evidence for the beneficial effects of spirituality in science and medicine. Thomason and Brody (1999) state a need for increased clarity and precision to distinguish religiosity from spirituality and challenge research to work for a shared definition of spirituality.

"Spirituality" is difficult to define because there is insufficient information about exactly what characteristics and behaviors constitute a spiritual individual. Wuthnow (1998, cited in Thomason and Brody, 1999, p. 96) states, "…spirituality consists of all the beliefs and activities by which individuals attempt to relate their lives to God or to a divine being or some other conception of a transcendent reality…" thus creating a more inclusive definition of spirituality.

Seidl (1993) describes the characteristics of spiritual health as freedom from addictive habits, fulfillment in self, others, work and leisure, taking time to meditate, balancing physical, emotional and spiritual behaviors, and taking responsibility for health. He defines spirituality, as that aspect of an individual's well being responsible for organizing the values, relationships, or meaning and purpose of their lives (Seidl).

Spirituality research and the role it plays in relationship to health, wellness and health promotion is increasing (Bellingham, Cohen, Jones, & Spaniol, 1989; Bensley, 1991; Chapman, 1986; Osman, 1979; Seaward, 1991). The number of books and articles discussing the importance of “faith,” “spirituality,” and prayer in healing and health has seen a dramatic increase. When polled regarding their belief in healing power of personal prayer 82% of 1004 Americans responded affirmatively and 73% of these individuals

believed praying for someone else can help cure their illness (Kaplan, 1996). Byrd (1988, cited in Levin, 1993) performed a double blind, controlled clinical trial over the benefits of absent prayer and found positive therapeutic effects for patients in a coronary care unit who were prayed for by outsiders.

There are a number of reports attesting to the role an individual's level of spirituality plays in helping to maintain an individual's health and well being. The individual's spiritual component is a principal factor in health related attitudes (Hiatt, 1986). Spirituality refers to the concepts, attitudes, and behaviors that derive from an individual's experience of that dimension (Hiatt). Michello (1988) found support for the hypothesis that there was a relationship between emotional well being, spiritual well-being, and satisfaction with health. More specifically, Michello (1988) reported that even though a "relationship with God" was important for individuals in general, it had an even greater impact on satisfaction with health for those who were physically limited. This is important information when considering the provision of effective healthcare to individuals. These findings (Michello, 1988) would suggest that an individual's physiological health and their spiritual and emotional health should be integrated into their care. Although Michello found a connection between spiritual factors and satisfaction with health, the question remains whether this spiritual level of the individual serves as a protection against or buffer from illness.

Spirituality and spiritual well-being in an elderly rural population was investigated by DeCrans (1990). This study provides support for the positive effects that spirituality and spiritual well-being have on nursing interventions for elderly populations (DeCrans).

The findings suggest a positive relationship between spiritual well-being and perceived health. This positive relationship is similar to earlier findings of Bauwens and Johnson (1984, cited in DeCrans, 1990) who reported "…that spiritual well-being sustains an individual's wellness and wholeness."

Gray and Moberg (1977) conceptualized spiritual well-being to include all people even if they do not participate in organized religion or attend a religious institution. Moberg and Brusek (1978, cited in Ingersoll, 1998) identified several factors contributing to spiritual wellness and spiritual well-being. These included faith and belief in divinity, meaning in life, peace of mind, faith in other people, and harmony with oneself (Moberg and Brusek, 1978 cited in Ingersoll, 1998). According to Ingersoll (1998) Moberg further elaborated on seven factor-analyzed dimensions of spiritual well-being, including Christian faith, self-satisfaction, personal peity, subjective spiritual well-being, optimism, religious cynicism, and elitism.

Ingersoll (1994 cited in Ingersoll, 1998) reviewed the philosophical, theological, and social science literature regarding spirituality, spiritual well-being, and spiritual wellness. As a result, he derived seven dimensions, which included meaning, conception of divinity, relationship, mystery, play, experience, and a dimension which integrated the first six dimensions.

Westgate (1996, cited in Ingersoll, 1998) has further delineated the dimensions of spiritual well-being and spiritual wellness into meaning-purpose, intrinsic values, transcendent beliefs-experiences, and community relationship. Ingersoll's study (1998) was designed to refine his original seven dimensions for a spiritual wellness inventory.

He used a panel of spiritual leaders who had significant history in their chosen spiritual traditions. Qualitative interviews were used in order to provide support for the dimensions (Ingersoll, 1998). The outcome of his study resulted in an expansion of his original seven dimensions into 10 dimensions. These dimensions include conception of the absolute or divine, meaning, connectedness, mystery, sense of freedom, experience-ritual-practice, forgiveness, hope, knowledge-learning, and present-centeredness. These dimensions are consistent with previous research on spiritual well-being/spiritual wellness as a multidimensional construct (Ingersoll, 1998). Ingersoll reports that language is a limitation when attempting to identify dimensions of spiritual wellness and apply quantitative methods to validate its existence.

Chandler, Holden and Kolander (1992) define "spiritual" as "pertaining to the innate capacity to, and tendency to seek to transcend one's current locus of centricity, which transcendence involves increased knowledge and love." Based on their definition of spiritual, "spirituality" is independent of "religion" and they ascribe to the concept that spirituality and religiosity do not necessarily occur together but that spirituality can occur outside the realm of organized religion. A detailed model for spiritual wellness was developed (Chandler, Holden and Kolander, 1992) which includes having the openness to pursue spiritual development. Additionally, in this model spiritual health is presented as a central core for each of the wellness dimensions rather than a separate dimension (Chandler et al.). Ardell (1982) presented a similar circular model of the wellness dimensions. However, rather than spiritual health as the core, Ardell placed self-responsibility as the core, which influences the remaining wellness dimensions.

DeLeon (personal communication, April, 1999) defines spirituality as consisting of two components. These components include 1. Having a sense of something larger beyond the horizon that we aspire to, something more than is apparent, a quest for fulfillment and 2. Being totally authentic, reaching beyond the "self", having a higher power, God. According to DeLeon, spirituality is seeking to be non-narcissistic. In this definition of spirituality there is a "restlessness" that needs to be thought of in terms of relationships, and a pragmatism whereby there is no bottom line to spiritual development.

Ardell (1996) discusses the evolution of spirituality within the concept of wellness. However, as a construct it is difficult to develop a clear, observable, and measurable definition of spirituality. For example, Chandler, Holden, and Kolander's (1992) definition of "spirituality" as "pertaining to the innate capacity to, and tendency to seek to transcend one's current locus of centricity." This transcendence involves increased knowledge and love. Additionally, DeLeon's (personal communication, April, 1999) definition of spirituality as a sense of something larger we aspire to is difficult to devise a measure that will clearly be able to observe such characteristics.

Hawks and associates (1995) reviewed the research on spiritual health definitions, intervention programs enhancing spiritual health, and relationships between spiritual health interventions and behavioral, emotional, and physical health outcomes. Findings suggested physical and emotional health were connected to healthy spirituality (Hawks et al.). Taking responsibility for health is one characteristic of spiritual health (Seidl, 1993).

Elkins, Hedstrom, Hughes, Leaf and Saunders (1988, p.11) define "spirituality" as "a way of being and experiencing that comes about through awareness of a transcendent

dimension that is characterized by certain identifiable values in regard to self, others, nature, life and whatever one considers to be 'The Ultimate'." According to the National Wellness Association (http://www.wellnesswi.org/nwa/spiitua.html/, 1999) the spiritual dimension involves seeking meaning and purpose in human existence. This dimension consists of deep appreciation for the depth and expanse of life and natural forces that exist in the universe (http://www.wellnesswi.org/nwa/spiritua.html, 1999). Ardell (1996) suggests a more secular approach to spirituality. In terms of spirituality and wellness issues Ardell embraces a definition of spirituality to characterize an individual with meaning and purpose in life (1996). Furthermore, spirituality can consist of matters pertaining to the inner life, "what's it all about" (Ardell, 1996 p.32), and existential concerns.

Existentialism and Spirituality

Existentialism is a philosophical movement of the nineteenth and twentieth centuries. It is difficult to arrive at a precise definition. However, clear themes that stand out are individual existence, individual freedom, and individual choice (http://encarta.msn.com/index/conciseindex/0F/00FD4000.html, 1999). Existentialism provides a holistic perspective of the individual in the now (Avila, 1995). Existential philosophy attempts to describe our desire to make rational decisions despite existing in an apparently irrational universe (Wyatt, 1998). Frankl (1984, p. 123) states, "the term 'existential' may be used in three ways: referring to; 1.*existence* itself or the specifically human mode of being 2. *meaning* of existence and 3. *striving* to find a concrete meaning in personal existence, that is to say, the will to meaning."

Existential psychology represents a meshing of philosophy and psychology (http://oldsci.eiu.edu/psychology/Spencer/Existential.htm, 1999). Maslow (Stahlman, 1992) focused on the concept of experiences being as unique as the individual experiencing them. These transcendent experiences, which occur universally, are characterized as being of a theistic, supernatural, or non-theistic content. Addressing issues such as transcendence, limits of human experience, personal sense of authenticity, and commitment, existentialist thought influenced twentieth (20^{th}) century theology (Encarta online, 1997-1999). Maslow defined these experiences as "peak experiences" (Stahlman, p.1). The characteristics connected with peak experiences include a unifying, noetic, ego-transcending experience, giving an individual a sense of purpose and a sense of integration (cited in Stahlman). Maslow believed these "peak experiences" could be awakened in an individual in activities and settings that were not religiously oriented (Stahlman). Herbert Benson (1995) reported these peak experiences had qualities similar to the experience of meditation or prayer. However, labeling them "peak experiences" secularized them and disconnected them from an organized religious context.

Bellingham, Cohen, Jones, and Spaniol (1989) focused on an individual's connectedness to self, to others and to a larger meaning and purpose. Their premise suggested that individuals experiencing a sense of connection in the three spheres (self, others, & larger meaning and purpose) increase the level of their spiritual health (Bellingham et al.). Chapman (1986) suggested a spiritually healthy individual has developed his spiritual nature to the fullest potential including developing and

articulating purpose in life, experiencing love, joy, peace and fulfillment or what Maslow (Stahlman, 1992) would label “peak experiences.”

Spirituality in the 80's and 90's is what existentialism was in the 50's and 60's (Arnkik, 1995). Spirituality and existentialism have similarities including difficulty delineating a precise definition, and an emphasis on the individual's experience of connecting to themselves and others. Additionally, there is an emphasis on the meaning and purpose in life, an emphasis on the experience of being authentically human, an emphasis on the experience of a transcendent dimension, and an emphasis on the experience of love, joy, peace and fulfillment (Chapman, 1986). Existentialism and spirituality consist of an appreciation for the expansive depth of life and forces that exist in the world (National wellness Association online, 1999). Spirituality and existentialism, although highly related have some differences. Existentialism focused on the anxiety and loneliness of being human, the absurdity connected to facing life directly, and generally was quite a gloomy concept (Arnink, 1995). Modern spirituality focuses on one's ability to rise above disconcerting feelings and troubles, the "golden road" to pursuing happiness, and emphasizes the positive and bright (Arnink).

Spirituality vs. Religiosity

Distinguishing between spirituality and religiosity is an important distinction since spirituality does not necessarily indicate someone’s religiosity and vice versa. Chandler, Holden, and Kolander (1992) ascribe to the concept that being spiritual is not necessarily concomitant with religiosity or even tied to a "church." Spirituality was considered one aspect of a larger realm namely, religion (Levin, 2001, p 9). In fact,

according to Levin (2001, p9) “attaining spirituality … is an ultimate goal of religion, and is a state not everyone reaches.” Spirituality, according to Cairns (1999), concerns the connectedness with self, others, environment and the *“Other”* (italics added).

Religiosity

Religiosity has been defined in the following ways "adherence to the beliefs and practices (rituals) of an organized church or religious institution" (Shafranske & Maloney, 1990, p. 72), “the behaviors, attitudes, beliefs, experiences, and so on, that involve this domain of life” (Levin, 2001, p 9), as well as “postures and acts done alone or in company with others that preserve practices and spiritual understandings for the good of the terminally ill” (Cairns, 1999). Religiousness is defined (Webster’s New Twentieth Century Dictionary, 1983) as a measure of personal beliefs or practices within any specific religious system of worship or conduct.

How spirituality differs from religiosity

The primary difference in the definition of spirituality and religiosity includes the notion that individuals labeled as more religious are more likely to be affiliated with an organized church or religious institution. Spiritual individuals do not necessarily belong to an organized institutional church. It is possible for an individual to be spiritual without being religious. Research has been conducted assessing religiosity's affect on health (Ellison, 1998; Hixson, Gruchow, & Morgan, 1998; King, 1990; Koenig, George, & Peterson, 1998; Pressman, Lyons, Larson, & Strain, 1990; Ritter, 1997; Sloan, Bagiella, & Powell, 1999; Strawburg, Cohen, Shema, & Kaplan, 1997). Perrin and McDermott (1997) reviewed the spiritual dimension in health and reported several studies supporting

the relationship between religion and health. Idler's research (1987, cited in Perrin and McDermott) found religion had a positive affect on individual's health by reducing health destructive behaviors, activating a social support network, providing a system for making sense of life, and modifying perceptions of distress connected to physical suffering.

Jenkins and Pargament (1995) reviewed the research on religion and spirituality as resources for coping with cancer. Pargament and associates (1988, cited in Jenkins and Pargament) identified, in a Protestant denomination sample, strategies employed to maintain control in coping, including viewing God as a partner, delegating responsibility to God, and assuming God had provided themselves with the ability to solve problems for themselves. Research conducted on extrinsic versus intrinsic religious orientation (Allport, 1960, cited in Jenkins and Pargament) indicate individuals operating from an extrinsic religious orientation (Allport) use their religion to reinforce social status, justify a way of life or gain a sense of safety. Alternatively, according to Allport, operating from an intrinsic religious orientation reflects an integration of religious beliefs and practices. Thus, the individual "lives" his/her religion. Several studies reviewed by Jenkins and Pargament (1995) suggested individuals exhibiting an extrinsic religious orientation have no significant relationship to coping and adjustment specifically with cancer patients. However, measures of intrinsic religiousness corresponded to increased amounts of hope and decreased amounts of anger and hostility. Intrinsic religiosity has been associated with a traitlike correlate of “self-soothing” (Levin, Wickramasekera, & Hirshberg, cited in Ellison & Levin, 1998) which is the ability to enter an altered state of consciousness.

Levin and Schiller's (1987, cited in Levin, Larson, & Puchalski, 1997) review of the medical literature over the last 100 years found religious terminology in more than 200 published studies. Relationships between morbidity and mortality were found for many diseases such as hypertension, cancer, and heart disease. Furthermore, relationships were found between religious belief and health measures. Positive relationships were found between religious belief and health status indicators such as self-reported health, symptomology, disability and longevity. Levin and associates (1997) cite reviews and meta-analyses that quantitatively confirm religious involvement as an epidemiological protective factor. Research studies have found beneficial health effects of religious practice such as attending religious services, religious observance, and religious involvement with several populations including elderly and physically ill (Koenig, 1994).

Hixson, Gruchow, and Morgan (1998) examined the relationship between religiosity dimensions and selected health behaviors, and blood pressure measures for a group of females. The study was designed to determine which dimension of religiosity most strongly related to blood pressure and whether direct or indirect effects of religiosity had a greater influence on blood pressure (Hixson et al.). Results supported the beneficial nature of religiosity on blood pressure (Hixson et al.). The intrinsic religiosity and the religious coping dimensions had the greatest impact. Intrinsic religiosity was defined by Koenig, Smiley, and Gonzales (1988, cited in Hixson et al. P.547) as "a way of being religious that regards faith as a supreme value in its own right; the person finds motivation and meaning for life in their religion.

Additionally, religiosity's influence on college student adjustment (Hester and Pham, 1999), and religious views on the relationship to stress and coping (Christopher, 1999) were studied. Unfortunately, religious beliefs do not uniformly result in positive health outcomes. Jarvis and Northcott (1987, cited in Perrin and McDermott, 1997) stated the negative aspects of religious involvement include instances such as ritual suicides, marriage customs, and unhealthy practices. Furthermore, religion has been found to be a source of stress (DeFleur, D'Antonio & DeFleur, 1971, cited in Perrin and McDermott) because individuals who ascribe to a religious belief system with an external locus of control may comply with health behaviors to the point of refusing medical treatment.

Hall and associates (1996) reviewed the religiosity measures literature. They reported on Allport's concepts of intrinsic and extrinsic religiousness as one of the most widely studied. Allport and Ross (1967, cited in Hall et al.) differentiated between an intrinsic and extrinsic religious individual by stating, " the extrinsically motivated person uses his religion, whereas the intrinsically motivated person lives his religion."

Religiosity and Health

Research has demonstrated an increased connection between religion and/or religiosity with health, health behaviors, and the practice of medicine (Anandarajah & Hight, 2001; Astrow, Puchalski, & Sulmasy, 2001; Cairns, 1999; Jenkins & Pargament, 1995; Kim,Heinemann, Bode, Sliwa, & King, 2000; Levin, 2001; Levin, Larson, & Pulchaski, 1997; Sloan, Bagiella, & Powell, 1999; Oleckno & Blacconiere, 1991; Ruesch & Gilmore, 1999; Waldfogel, 1997). Ellison and Levin (1998) review the empirical

evidence connecting the effect of religion on physical health, morbidity, and mortality. They evaluated several hundred empirical studies with one or more religious indicators and one or more physical health measures. Studies with one or more religious indicators and one or more physical health outcomes showed a positive relationship between high levels of religious involvement and reports of better health status (Ellison & Levin, 1998).

Koenig and George (1998) found a strong correlation with the religious involvement of church attendance and lowered blood pressure in an older population (65 years of age or older). This connection was found for all participants, however, was particularly strong for African Americans and individuals under 75 years of age. Although no cause-effect relationship was delineated, their findings were consistent with other research finding improved coping for more spiritual individuals.

Ellison and Levin (1998) suggest explanatory mechanisms which may impact and lead to positive health outcomes. The mechanisms included regulating lifestyles/health behaviors, increased levels of social ties and support mechanisms, increased sense of personal mastery, increased ability to cope with stressors, generally increased positive emotions, increased healthy beliefs and finally, a healing bioenergy. Benson (1996) reported on research that found changes in physical measures such as lowered heart rate, blood pressure and breathing rate when individuals engaged in activities including Christian prayer, transcendental meditation (TM), biofeedback, hypnosis, and relaxation techniques. Results of theses studies indicated even though intellectually we distinguish between prayer and meditation the physical response of our bodies do not distinguish.

Religion can have an effect on lifestyle behaviors, as well as individual positive emotions. Ellison and Levin (1998) proposed the practice of religion impacts emotional expression through psychoneuroimmunological or neuroendocrine pathways, which ultimately impact physiological pathways. According to Levin (1993) the psychodynamics of religious rites suggest that experiences such as ritual prayer may trigger a myriad of emotions, which may lead to changes in health through influences on the immune system. Levin, Wickramasekera, and Hirshberg (cited in Ellison and Levin, 1998) suggest a connection between an intrinsic religiosity and "self-soothing" (p 708) coping ability and having the ability enter an altered state of consciousness.

Previous research has found support for lower rate of cancer among religious groups (Gardner and Lyon, 1982), which was attributed to participation by religious members in positive dietary health behaviors. Additionally, higher levels of religiosity have been associated with lower levels of hypertension and mortality (Jarvis & Northcott, 1987; Levin & Vanderpool, 1987).

Locus of Control

Intrinsic/extrinsic views are the basic components of social learning theory often called internal-external control of reinforcement (Ryckman, 1989, p.468). Rotter (1966) believed individuals develop one of two beliefs. Individuals tend to believe obtaining a reinforcer is under their control and based on their behavior, or they believe there is no connection between obtaining a reinforcer and their behavior. The latter individuals believe fate, chance, or powerful others control reinforcement (Ryckman, 1989, p.468).

Individuals who believe they are in control of obtaining reinforcement are labeled as having a high internal locus of control. Similarly, individuals who believe reinforcement is controlled by outside factions are labeled as having a high external locus of control. Locus of control has been studied with a variety of populations under a variety of conditions. For example, the relationship between locus of control, and constructs such as performance effectiveness (Findley and Cooper, 1983 cited in Ryckman, 1989), persuadability (Lefcourt, 1971 cited in Ryckman, 1989), and social skills (Lefcourt, Martin, Fick, & Saleh, 1985 cited in Ryckman, 1989) has been studied. Additionally, locus of control has been the focus of several studies on an individual's health and engaging in health related behavior.

Locus of Control and Health

A current trend in the health and health behavior literature is focused on locus of control and the construct of spiritual health. Spiritual health is defined as "a high level of faith, hope and commitment in relation to a well-defined worldview or belief system that provides a sense of meaning and purpose to existence…" (Hawks, 1994, cited in Hawks, Hull, Thalman & Richins, 1995, p. 373). Attitudes such as faith, hope, and commitment, pertain to an individual having an internal locus of control (Waite, Hawks, & Gast, 1999).

Wurtele, Britcher, and Saslawsky (1985) studied health locus of control, health value, and participation in preventive health behaviors in women. They predicted individuals reporting a high internal health locus of control and high value on health would be more likely to practice preventive health behaviors (Wurtele, Britcher, & Saslawsky). Findings indicated locus of control was not as strong a predictor of positive

health behavior as was value placed on health (Wurtele et al.). A limitation of the study was the limited demographics of the population. Participants were healthy, socially advantaged college aged women. Such a narrowly defined group may impact the findings by decreasing their generalizability.

Waite, Hawks, and Gast (1999) studied spiritual well-being and health behaviors. The strongest relationship between spiritual health and participation in health promoting behaviors was found when spiritual health sub-scales were combined into a composite score prior to analysis. A composite spiritual health measure includes variables such as locus of control, connectedness, and self-esteem (Waite et al.).

Therefore, to measure how much an individual takes responsibility for their health several health locus of control scales were developed (Achterberg and Lawlis, 1990; Wallstein, Wallstein and DeVellis, 1978). The Multidimensional Health Locus of Control (MHLC) scale has been used in a significant number of studies with a variety of populations (Bundek, Marks, & Richardson, 1993; Carlson & Petti, 1989). Carlson and Petti (1989) assessed the relationship between college students' participation in physical activities and their self-reported health locus of control. Results from this study produced a conceptual model. This conceptual model indicated individuals who reported having a high internal health locus of control participated in greater physical fitness activities (Carlson & Petti). Additionally, results indicated participants labeled as having high internal health locus of control were linked to activities that had higher metabolic requirements and the physiological gains that coincide with these activities (Carlson & Petti).

The Multidimensional Health Locus of Control scale was used as a model to develop the Sports Rehabilitation Locus of Control (SRLC) (Murphy, Foreman, Simpson, Molloy, & Molloy, 1999) scale. This scale evaluates the locus of control of injured athletes. The findings from studying injured athletes using this measure were that internal locus of control was positively associated with adherence to treatment (Murphy et al., 1999).

Measuring spirituality

Several spirituality/religiosity measures have been developed over the last several decades. Hall, Tisdale, and Fletcher-Brokaw (1996) provide a review of the religiosity and spirituality measures that have been developed. The review evaluated the measures for psychometric soundness, clinical utility, strengths, weaknesses, and directions for further research. Perrin and McDermott (1997) reviewed the spiritual dimension of health literature and reported current difficulties include a lack of standardized language for measuring spirituality in health. Many of the instruments they reviewed were tied to Western Judeo-Christian concepts of religion (Perrin & McDermott). These include such instruments as Hilty and Pneuman's Religious Attitude and Belief Survey (1982, cited in Perrin & McDermott), Paloutzian and Ellison's Spiritual Well-being Scale (1982), Allport's Religious Orientation Inventory (1967, cited in Perrin & McDermott), and Genia's Spiritual Experience Index (1991).

Paloutzian and Ellison (1982) developed the Spiritual Well-Being Scale (SWBS). The SWBS was designed as a general indicator on the subjective state of well-being of an individual (Paloutzian & Ellison). The SWBS contains twenty (20) items rated on a six

(6) point Likert-type rating scale. Three scores are obtained including a total score, a religious well-being score and an existential well-being score. Religious well-being items assess an individual's sense of well-being in relationship to God while the existential well-being items assess an individual's sense of satisfaction with their purpose in life separate from specific religious source (Paloutzian & Ellison).

The Spiritual Experience Index (SEI) developed by Genia (1991) is a means of assessing level of spiritual maturity. The SEI is theoretically based in a developmental versus a multidimensional conceptualization of faith (Genia, 1991). This self-report measure contains thirty-eight (38) items rated on a six (6) point Likert-type scale.

Hatch, Burg, Naberhaus, and Hellmich (1998) noting the increasing importance of spiritual issues in relation to both psychological and physical health developed the Spiritual Involvement and Beliefs Scale (SIBS). In developing this measure their goal was to design a comprehensive, applicable, and credible instrument that assesses spirituality. A previous limitation of measures, according to Hatch and associates was that most measures of spirituality were narrowly focused with a religious Judeo-Christian perspective. The goal for the SIBS was to have a scale that would provide a quantitative credible method of spiritual inquiry and facilitate the scientific study of the role of patient spirituality in medical care (Hatch et al.).

The SIBS, a 26-item instrument, was designed so that the items assess both the belief in and behaviors engaged in by individuals high in spirituality (Hatch et al., 1998). Analysis of the SIBS indicated a strong internal consistency and strong test-retest

reliability (Hatch et al.). The SIBS showed fairly high convergent construct reliability when compared to Spiritual Well Being Scale (SWBS) (Hatch et al.).

Spirituality and Health

Williams (1998) reported on the relationship between spirituality and health. Using the Spiritual Experiences Index (Genia, 1991) Williams reported healthier individuals have a higher level of spiritual experience (1998). Additionally, these findings suggested higher spiritual experiences were positively correlated with less perceived interference with physical symptoms. A study conducted to assess the association between patients' intrinsic spirituality and reported health outcomes at a family practice center (McBride, Arthur, Brooks, and Pilkington, 1998) hypothesized level of spirituality would have a relationship between patient overall health and patient experience of pain. The findings indicated overall health varied significantly depending on level of spirituality reported. The most statistically significant differences were reported between individuals identified as belonging in the extreme groups of low-level spirituality and high-level spirituality (McBride et al.).

A curvilinear relationship was found between spirituality and individuals' physical pain experience (McBride et al., 1998). Individuals in the low and high spirituality groups experienced the most pain while individuals in the moderate spirituality group reported a lower level of physical pain (McBride et al.). McBride and colleagues (1998) suggested future research should consider assessing a patient's spirituality as it assists with prioritizing and presenting patient treatment options, and

improving patient satisfaction and compliance with treatment. Patient compliance with a treatment regimen is connected or influenced by the patient's locus of control.

Kass, Friedman, Leserman, Zuttermeister, and Benson (1991) were interested in the relationship between health outcomes and spiritual experience and developed the Index of Core Spiritual Experience (INSPIRIT). The goal of the INSPIRIT was to assess the characteristic elements observed in core spiritual experience. These elements included "a distinct event and cognitive appraisal of that event which resulted in a personal conviction of God's existence (or some form of external higher power and the perception of a highly internalized relationship between God and the person" (Kass et al., 1991, p 204). The results found strong reliability and validity for the INSPIRIT (Kass et al.) and indicated a relationship between spiritual experiences and health outcomes. Individuals' core spiritual experiences and reported medical symptoms indicated core spiritual experiences were related to decreased medical symptom reporting (Kass et al.) and reporting improved quality of life.

Waite, Hawks, and Gast (1999) studied spiritual well-being and health behaviors. The Health-promoting Life-style Profile II (Walker, Sechrist, & Pender, 1987 cited in Waite et al., 1999) was used due to the measures' three sub-scales (health responsibility, spiritual growth, and interpersonal relations). According to Waite and associates (1999) these sub-scales correspond conceptually to the notion that spiritual health as a construct may encompass factors such as locus of control, sense of coherence, self-esteem, and connectedness. Results suggested spiritual health was positively related to the performance of health behaviors (Waite et al., 1999).

Riley and colleagues (1998) empirically identified types of spiritual well being among individuals with physical disabilities, and chronic illness to assess if types of spiritual well being were related to differences in health, quality of life, and life satisfaction. Their findings provided strong support for the hypothesis that spirituality has a positive relationship to health behaviors and attitudes (Riley et al.) and is associated with level of quality of life for those experiencing chronic illness or disability. In fact, individual's identified as "existential" in their spirituality (versus religious or non-spiritual) had the highest level of vitality, physical, social, emotional and mental health (Riley et al.). Individual's in the "existential cluster" were identified by responses such as: I have a reason for living, I feel a sense of purpose in my life, I have a personally meaningful relationship with God, and I feel most fulfilled when I am in close communication with God (Riley et al.). Additionally, those in the existential group described their lives as having less conflict and appeared to be functioning at a higher level particularly in the areas of physical and emotional well being (Riley et al.).

CHAPTER TWO

RATIONALE AND HYPOTHESIS

The literature, cited in this review, has provided support for the role spirituality plays in health (Banks, Poehler, & Russell, Diaz, 1993; Fahlberg & Fahlberg, 1991;McGuire, 1993;Osman & Russell, 1979;) including evidence for the positive relationship between spirituality and level of interference from current physical symptoms (Williams, 1998). However, studies assessing the relationship and influence of the level of spirituality in combination with health locus of control on an individual's participation in wellness behaviors, wellness lifestyle, or health related choices are lacking. Research to determine the relationship between spirituality, health locus of control, and engaging in positive wellness behaviors is limited in the empirical research arena. Previous research studies have reported a link between individuals acknowledging a higher level of internalized spirituality, reporting a sense of personal control and engaging in healthier lifestyle choices (nutrition, exercise, stress management) (Mckee & Chappel, 1992; Waite et al, 1999). Likewise, previous studies have suggested that religion may inhibit health behavior in individuals adopting a religious belief whereby they experience locus of control as external to themselves (King, 1990). Therefore, an individual who reports an externalized spirituality, viewing a "powerful other" or "chance" as in control, may not engage in health promoting lifestyle choices. Finally an individual's level of spirituality and type of health locus of control may have an effect on their physical health in general (blood pressure and lipid levels). In summary, the present

study determined if a positive relationship exists between internalized spirituality, internalized health locus of control, and participation in wellness/health behaviors. Additionally, it is hypothesized those who report internal spirituality, internal health locus of control and participation in positive wellness/health behaviors will show higher levels of physical health.

Hypothesis

The hypothesis in this study was that individuals who reported having internalized spirituality and internal health locus of control would participate more often in health/wellness behaviors and be physically healthier than those who did not.

This hypothesis has the following components:

Modern spirituality focuses on one's ability to rise above disconcerting feelings and troubles (Arnink, 1995), seek and find meaning and purpose in life (Ardell, 1996; National Wellness Association online, 1999), and a quest for fulfillment (DeLeon, personal communication, April, 1999). A strong relationship between spiritual health and participation in health promoting behaviors (Waite et al., 1999) was observed. Therefore,

1. Individuals with a strong internal spirituality will be more likely to be associated with an internal health locus of control and engaging in positive health promoting lifestyle behaviors.

The emphasis in the current health and health behavior literature focuses on locus of control and spiritual health (Hawks, 1994, cited in Hawks et al., 1995) and health locus of control and participating in preventive health behaviors (Wurtele et al., 1985). It is suggested that locus of control is not a strong predictor of

positive health behavior, however, since the generalizability of the study was limited, the second, third and fourth sub-hypotheses were

2. Having an internal spirituality and an external (powerful others or chance) health locus of control will not be associated with engaging in positive health promoting lifestyle behaviors; however, having an external spirituality and an internal health locus of control will be associated with participation in positive health promoting lifestyle behaviors
3. Having an external spirituality and an external health locus of control will not be associated with participation in health promoting lifestyle behaviors.

The relationship between religion and physical health is controversial. Research on religion and health (Idler, 1987, cited in Perrin and McDermott, 1997) has suggested religious individuals positive health resulted from reducing health destructive behaviors, activating a social support network, helping to make sense of life and modifying perceptions of physical suffering. Jarvis and Northcott's (1987, cited in Perrin and McDermott) findings suggested religious beliefs resulted in unhealthy practices. DeFleur and associates found religion and religious beliefs combined with an external locus of control may lead to harmful health behaviors even to the point of refusing medical treatment. Limited empirical evidence exists which evaluates "spirituality's" relationship with physical health.

4. Individuals with high internal spirituality and internal health locus of control will be physically healthier as rated by cholesterol levels, Body Mass Index (BMI), and blood pressure readings.

The literature on the interaction between spirituality and health locus of control on positive health promoting behaviors is limited. Therefore the fifth hypothesis was

5. A significant synergistic association between internal spirituality and internal health locus of control will be associated with participation in positive health behaviors.

CHAPTER THREE

METHOD

Participants

Participants were recruited voluntarily among employees of a moderate to large organization (N = 138), The University of North Texas Health Science Center at Ft. Worth (UNTHSC). Fourteen participants withdrew for undisclosed reasons and the experimenter excluded 9 participants' data due to either incomplete or unusable data leaving a total of 115 participants. The sample was composed of 39 males (33.9%) and 76 females (66.1%). Participants' ages ranged from 21 to 65 years of age (M = 41.12 SD = 11.32). Ethnicity of participants included 88 White (non-Hispanic) (76.5%), 8 Black (7.0%), 8 Asian (7.0%), 7 Hispanic (6.1%), 2 Native American/Alaskan Native (1.7%) and 1 Middle Eastern (.9%). Participants identified their religious affiliation and included 32 Protestant (27.8%), 15 Catholic (13%), 13 Baptist (11.3%), 10 None (8.7%), 8 Methodist (7%), 7 Christian non-denominational (6.1%), 4 Unitarian and Non denominational (3.5% each), 2 each of Buddhist, Hindu, Lutheran, Other (non specified), and Orthodox Christian (1.7% each) and 1 each acknowledged Muslim, Agnostic, Inner, Episcopal, Druidic, charismatic, "own" (0.9 % each). Educationally, 31 completed a Bachelors degree (27%), 29 completed high school (25.2%), 24 completed a Masters degree (20.9%), 13 completed a Ph.D./Professional degree (11.3%), 11 completed an Associate's degree (9.6%) and 4 did not complete high school (3.5%).

Materials

Participants completed the following self-report paper and pencil assessment measures of their level of health, participation in wellness behaviors, health locus of control, and spiritual involvement and beliefs.

Spiritual Involvement and Beliefs Scale (SIBS) (Hatch, Burg, Naberhaus, & Hellmich, 1998) See Appendix A. Spirituality and spiritual well-being have been measured with a variety of instruments. The SIBS is a 26-item measure designed to assess an individual's level of spirituality. The SIBS was developed to assess aspects of spirituality not covered with other instruments (Hatch et al., 1998). The SIBS is unique as it measures both an individual's beliefs about spirituality and his/her spiritual involvement and activity (Hatch et al., 1998).

This instrument measures four "categories" of spirituality including 1) external/ritual spirituality, 2) internal/fluid, 3) existential/meditative, and 4) humility/personal application (Hatch et al., 1998). Individuals who report higher levels of external/ritual spirituality have been found to focus on belief in external power. Reporting a higher internal/fluid level of spirituality has been found to be consistent with internal and evolving growth beliefs. Existential issues are addressed by the existential/meditative subscale while application of spiritual principles in daily activities clustered under category four. The SIBS is scored using a Likert scale. Responses ranged from strongly agree (5) to strongly disagree (1). This SIBS is composed of positively and negatively keyed items.

Multidimensional Health Locus of Control Test (MHLC) (Wallstein, Wallstein, & DeVellis, 1978) See Appendix B. The Multidimensional Health Locus of Control test is an 18-item questionnaire measuring beliefs about the causes and cures of illness (Wallstein et al., 1978). Individual's completing this measure are asked two basic questions, "Why do or did you get sick?" and "How can you get well?" The MHLC is based on Rotter's (1966) concept of internal and external locus of control influencing the individual's behaviors in their lives.

Achterberg and Lawlis' (1990) review of the literature indicated two outcomes related to medical patient's health shown in the locus of control research conducted in medical settings. Primarily, an individual who ascribes to an internal health locus of control will be more likely to actively participate in their medical care. Conversely, individual's who are more external in their health locus of control tend to be more passive and look to the medical providers to guide and take care of them as patients.

The MHLC classifies individuals as those who express a more internal health locus of control versus those who express an external health locus of control. Internal locus of control characterizes individuals who are more likely to actively participate in their health care. They take better care of their physical well-being. They collaborate with clinicians often asking more questions and following through on treatment recommendations. Conversely, external locus of control indicates an individual who focuses outside of him/herself for medical/healthcare. These individuals are more likely to view medical personnel as having the ability to "fix" them. They will be less likely to adhere to treatment recommendations.

The MHLOC has three subscales: the internal health locus of control (IHLOC) scale; the “powerful others” health locus of control (POHLOC) scale; and the “chance” health locus of control (CHLOC) scale. The internal scale describes an individual who takes a more active involvement in their health and health care. The "powerful other" describes an individual more likely to rely on the medical profession to take care of their health. Finally, the "chance" scale describes an individual who perceives their health is based on fate or chance and they have no control over their health. There are parallel forms of the MHLOC available (A and B), which can be used separately or combined to create more reliable subscales (Fischer & Corcoran, 1994).

Reliability estimates for the Multidimensional Health Locus of Control scales indicated internal consistency with Chronbach's alpha, ranged from a = .67 to a = .77 for all six scales (three dimensions and two forms). Combining the two forms creating a 12-item scale resulted in alphas, which ranged from a = .83 to a = .86. The MHLC were found to have fairly good criterion validity (Fischer & Corcoran, 1994) and, with the exception of the chance scale, were not correlated with social desirability.

The Center for Disease Control’s Health Risk Appraisal (Carter Center Emory University & Center for Disease Control, 1987) See Appendix C was administered to participants. This is a 45-item self-report measure of the individual's health behaviors indicative of their overall health risk. This instrument included items that asked about participation in adaptive lifestyle choices, diet and exercise (such as eating behaviors and physical activity level) and health and wellness behaviors (smoking, drinking and overall health rating). Individuals report how often they participate in physical activity (less than

once a week, 1-2 times per week, at least 3 times per week), whether they eat in a healthy manner (eat high cholesterol foods, eat high fiber foods), and level of smoking behavior (never, used to smoke, still smoke). The instrument classifies level of overall health into four groups (poor, fair, good, and excellent) along with level of life satisfaction (not satisfied, partly satisfied, mostly satisfied).

Physical measures of health/wellness collected included blood pressure and a blood chemistry including a lipid profile measuring triglyceride levels, cholesterol levels (HDL & LDL) and coronary heart disease risk ratios.

Apparatus

Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were assessed using a Welch Allen Tycos Model Hand held sphygmo manometer (man 1999-0831) certified 16-304millimeters of a column of mercury. Additionally, blood pressure was measured using a SunMark self-taking hand held sphygmomanometer (073642) certified 20-302 millimeters of a column of mercury.

Procedure

Participants were recruited during a Health Fair sponsored by the UNTHSC at Fort Worth Health Promotion committee. Participants signed a standard consent form see Appendix D and were provided with a packet of the self-report measures which were pre-numbered to insure subject confidentiality. Subjects completed the above paper and pencil self-report measures about their level of health locus of control, spirituality, and health/wellness behaviors.

Physical measures of health were assessed. These included individuals' blood pressure, how often they participate in physical activity and rating of their overall health. These non-invasive measures provided a general indication of level of physical fitness and health. Invasive physical measures of health were also collected. Participants participated in a standard blood draw in order to measure lipid levels (HDL, LDL, Total cholesterol, triglycerides, and cholesterol ratios).

Systolic and diastolic resting blood pressure was measured via the above apparatus. Blood pressures were assessed using qualified health services personnel (a second year Doctor of Osteopathy student and a Licensed V Nurse). Participants were asked to sit quietly for a period of five (5) minutes before blood pressure was measured. Blood pressures were recorded three times using alternating arms (e.g. Left, Right, Left). Alternating arms were chosen to decrease the potential for significant increases in pressure from recording from the same arm every time. Blood pressure measures were rated according to standard definition found in Bates Guide to Physical Examination (Bickley, 1999). Individuals were classified as having optimal to normal blood pressure, high normal blood pressure or hypertension.

Participants purchased cholesterol-screening vouchers for a nominal fee ($3.00), per the UNTHSC Institutional Review Board (IRB) policy prohibiting "free" screening. Vouchers purchased for blood chemistry readings were conducted at the University of North Texas Health Science Center laboratory housed within the UNT Health Science Center.

Individuals self-reported alcohol consumption by responding to the question How many drinks of alcoholic beverages do you have in a typical week? This number was then converted to a total amount of alcohol (in grams) by multiplying number of drinks by 10 as one beer, one glass of wine, one shot of liquor each contain 10gms of alcohol (N. O'Rourke, personal communication, March 19, 2001).

Individuals self reported their height and weight. Individual Body Mass Index (BMI) scores were computed based on self-reported height and weight measurements. BMI was computed using the equation BMI = weight (kilograms) divided by height $(meters)^2$ (weight [kg]/height $[mtrs]^2$) (ACSM, 2000).

Five hypotheses were tested. First, it was assumed that internal spirituality would be positively associated with an internal health locus of control and would be more positively associated with participation in positive health promoting behaviors. From this primary hypothesis the following sub-hypothesis were formed. Second, it was hypothesized that presenting with an internal spirituality and an external health locus of control would not influence participation in positive health promoting behaviors; however, presenting with an external spirituality and an internal health locus of control would be associated with participation in positive health promoting behaviors. Third, it was hypothesized presenting with an external spirituality and an external health locus of control would not be associated with participating in positive health behaviors. Fourth, it was hypothesized having an internal spirituality and an internal health locus of control would be associated with being physically healthier as rated by cholesterol levels, blood pressure and body mass index levels. Fifth, in addition it is assumed a significant

synergistic association between internal health locus of control and internal spirituality will be associated with participation in positive health behaviors. Range of correlation coefficients reflecting significance will include $r > .20$ will be considered marginally significant and $r > .50$ will be considered as indicative of a statistically significant relationship (Borg & Gall, 1989).

CHAPTER FOUR

RESULTS

The overall aim of this study was to examine how spirituality and health locus of control are related and whether positive health behaviors and health are predicted by self-reported spirituality and health locus of control.

The PRELIS program was used to estimate values for missing data (Jöreskog & Sörbom, 1996). Imputation was performed for missing values only on the continuous variables of Multidimensional Health Locus of Control and Spiritual Involvement and Beliefs Scale. As opposed to substituting mean item scores, PRELIS imputes values on the basis of like-responses. According to Little and Rubin (1987), this method is preferable to use of mean values which can obscure between group differences. Visual inspection of data and summary statistics did not reveal any discernable pattern among missing data (estimated at less than .5% of total data). Resulting sample size was 115.

Preliminary Analysis

Analyses were performed using SPSS 9.0. Prior to testing hypotheses, preliminary analyses were performed in order to determine whether the distribution of selected variables exhibited univariate normality. The Frequencies and Descriptives variables of age, health behaviors, physical health measures, Multidimensional Health Locus of Control, and Spiritual Involvement and Beliefs Scale were examined through procedures for accuracy of data entry, missing values, and skewness and kurtosis. Two cases with extremely high scores on amount of alcohol consumed were found to be

univariate outliers, however they were retained for analysis since consumption of alcohol is identified as a health behavior and deleting these cases may have impacted the analysis. Means, standard deviations, skewness, and kurtosis information for all variables analyzed in the present study are presented in Table one 1.

Reliability

Chronbach's alpha (a) was calculated for each scale in the analysis. Results demonstrated reliabilities of selected measures (see Table 1). The alpha for the Internal health locus of control (IHLOC) subscale was .76. The alpha for the Powerful others health locus of control (POHLOC) subscale was .62. The alpha for the Chance health locus of control (CHLOC) subscale was .61. Reliability analysis for the Spiritual Involvement and Beliefs Scale (SIBS) were computed and demonstrated adequate reliabilities. The alpha for the SIBS was .92. This is consistent with coefficient alphas reported by Hatch et al. (1998). The alpha for the External/ritual subscale of the SIBS was .92. The alpha for the internal/fluid subscale of the SIBS was .85. The reliabilities of the Spiritual Involvement and Beliefs Scale were generally consistent.

Factor Analysis

Principal components analysis (varimax rotation with Kaiser normalization) was performed on 16 items of The Spiritual Involvement and Beliefs Scale (Hatch et al., 1998). A two-factor solution was extracted creating uncorrelated regression variables. Each consisted of the items anticipated on the basis of prior research by Hatch et al. (1998).See Table 2 for the items, factor loadings, communality values, eigenvalues, and percent of variance. Factor loadings are highlighted to facilitate interpretation. The first

had an eigenvalue of 6.38, accounted for 39.9 % of the variance and matched the external/ritual spirituality scale described by Hatch and colleagues (1998). The second (internal/fluid spirituality) had an eigenvalue of 1.29 and accounted for 8% of the variance. Loadings for the individual items ranged from .40 to .80. Correlations performed on the SIBS scales from the current sample were significantly positively correlated ($r = .65$, $p < .001$) indicating the scales were not independent of each other.

Correlation Analysis

Pearson correlations were performed on all variables selected for analysis. Table 3 presents correlation coefficients. Age was positively associated with the blood pressure group ($r = .22$, $p < .05$) as higher age was associated with hypertensive blood pressure group. Male gender was significantly correlated with blood pressure group ($r = -.31$, $p < .01$) and correlated with coronary heart disease risk based on high-density lipoprotein (HDL) ratings ($r = -.39$, $p < .01$).

Test of Hypothesis One: Internal Spirituality would be associated with Internal Health Locus of Control and associated with more positive health promoting behaviors

The first hypothesis stated: Individuals with a strong internal spirituality will be more likely to have an internal health locus of control and engage in positive health promoting lifestyle behaviors. The Multidimensional Health Locus of Control (MHLOC) variables (internal, powerful others, chance) were correlated with the Spiritual Involvement and Beliefs Scale (SIBS) and the spirituality regression variables. Internal health locus of control ($M=28.03$, $SD=5.22$) was positively correlated ($r = .27$, $p < .01$) with the Internal/Fluid Spirituality component score variable. Similarly, Internal

health locus of control was positively correlated (r = .27, p <.01) with the SIBS internal/fluid spirituality subscale. Internal health locus of control was negatively correlated with powerful others health locus of control (M=16.78, SD=5.63; r = -.26; p < .01) and negatively correlated with chance health locus of control (M=14.96, SD=5.23; r = -.28; p < .01).

Internal health locus of control was negatively correlated with consumption of high cholesterol foods (r -.26, p < .01), and negatively correlated with the weekly alcohol intake (r = -.19, p < .05). Internal health locus of control was positively correlated with overall health rating (r = .23, p < .05). This finding is expected as those having an internal health locus of control identify themselves as having a role in their health and well-being.

Powerful others health locus of control was positively correlated with chance health locus of control (r = .37, p < .001). This finding is expected given the underlying assumption that having an internal health locus of control would be inversely related to having either a powerful others or chance health locus of control. Powerful others health locus of control was negatively correlated with amount of alcohol consumption (r = -.24, p < .05). Chance health locus of control was positively correlated with eating high cholesterol foods (r = .26, p < .01). A positive association was found between chance health locus of control and having an elevated blood pressure (r = .22, p < .05).

The Spiritual Involvement and Beliefs (SIBS) internal/fluid subscale was significantly positively correlated with the external/ritual spirituality subscale (r = .65, p < .001) see Table 3. The SIBS internal spirituality variable was positively correlated

with level of physical activity ($r = .21$, $p < .05$) and overall health rating ($r = .24$, $p = .01$). The SIBS internal spirituality variable was negatively correlated with consumption of high cholesterol foods ($r = -.23$, $p = .01$). Internal spirituality regression component variable was negatively correlated with coronary heart disease risk based on the level of HDL cholesterol ($r = -.30$, $p < .05$). Those who reported a higher level of internal spirituality were more likely to have a lower risk of coronary heart disease.

Power Analysis

In order to guard against Type II (Beta) errors with eight Independent Variables (alpha = .05) a sample size equal to or greater than 107 is required (Cohen, 1992). Sample size is adequate for multiple regression assuming a medium effect size.

Test of Hypothesis One: Regression Analysis

Hierarchical multiple regression was computed between the dependent variable of amount of alcohol consumed per week and the SIBS (internal, external) and MHLOC (internal, powerful others, chance) as the independent variables. Since it was predicted internal spirituality and internal health locus of control would be positively associated with participation in positive health promoting behaviors the Internal SIBS score and the IHLOC were entered as the first step ($R^2 = .05$, $p > .05$) (see Table 4). This did not provide a significant regression equation. Next, the external SIBS score and the external health locus of control scores (powerful others, chance) were entered. Results show that powerful others health locus of control (POHLOC) and internal health locus of control (IHLOC) provided a significant increase in the regression equation (? $R^2 = .094$, $p < .05$). The health locus of control scores (IHLOC, POHLOC) provide unique variance to this

regression equation over and above other measures (F[5, 105] = 3.53, p < .01). The standardized beta for POHLOC (ß = -.31, p < .01) and for IHLOC (ß = -.25, p < .05) indicates the relationship between POHLOC and IHLOC and amount of alcohol consumed per week is negative.

A hierarchical multiple regression was computed between dependent variable of total alcohol amount consumed per week and the independent variables of the spiritual regression components (internal, external) and the health locus of control scores (internal, powerful others, chance). The internal regression variable score and the IHLOC were entered as the first step (R^2 = .036, p > .05) (see Table 4). The external regression and external health locus of control (powerful others, chance) were included next. This step provided a significant increase in the regression equation (? R^2 = .109, p < .01). Results indicate POHLOC and IHLOC predicts amount of alcohol consumed per week. IHLOC and POHLOC scores provide unique variance to this regression equation over and above the other measures (F[5,105] = 3.6, p < .01). The standardized beta for POHLOC (ß = -.32, p < .01) and IHLOC (ß = -.28, p < .01) indicates the relationship between IHLOC, POHLOC and amount of alcohol consumed is negative.

Test of Hypothesis Two: Regression Analysis:

Hypothesis two stated that having an internal spirituality and external health locus of control would not influence participation in positive health promoting behaviors, however, having an external spirituality and an internal health locus of control would be associated with participation in positive health promoting behaviors. Hierarchical multiple regressions were performed between the dependent variable of health behavior

(total amount of alcohol consumed per week), and independent variables of Spiritual Involvement and Beliefs Scale (SIBS) (internal, external), and Health Locus of Control scores (internal health locus of control (IHLOC), powerful other health locus of control (POHLOC), chance health locus of control (CHLOC). Hierarchical multiple regressions were likewise performed between the health behavior (amount of alcohol) and the independent variables of external Spiritual regression component score and internal Spiritual regression component score, and Health Locus of Control scores (internal, powerful others, chance).

Hierarchical multiple regression was computed between amount of alcohol consumed per week as the dependent variable and SIBS, and Multidimensional health locus of control scales (internal, powerful others, chance) as the independent variable. Internal SIBS, POHLOC and CHLOC were entered as the first block ($R^2 = .09$, $p < .05$) (see Table 5). The health locus of control score (POHLOC) provides unique variance to this regression equation ($F[3,107] = 3.55$, $p < .05$). Next, the external SIBS and the IHLOC were entered. This step provided a significant increase in the regression equation (? $R^2 = .05$, $p < .05$). The IHLOC provides unique variance over and above other measures ($F[5, 105] = 3.53$, $p < .01$). The equation listed in Table 5 shows the effects of spirituality and health locus of control on amount of alcohol consumed. The standardized beta for POHLOC (ß = -.264, $p < .01$) and the standardized beta for IHLOC (ß = -.254, $p < .05$) indicate that the relationship between POHLOC and IHLOC and amount of alcohol is negative. The overall observed variance with all variables entered in the equation is 14.4%

Hierarchical multiple regression was performed between amount of alcohol as the dependent variable and the spirituality regression component score and MHLOC scores as the independent variables. Internal spirituality regression component score and external HLOC (powerful others, chance) scores were entered as the first step ($\underline{R^2}$ = .066, $\underline{p} > .05$). This step did not provide a significant regression equation. External spirituality regression component score and IHLOC scores were included next. This step provided a significant increase in the regression equation (? $\underline{R^2}$ = .08, $\underline{p} < .01$). Results indicate including IHLOC scores provides unique variance to this regression equation over and above the other measures ($\underline{F}$ [5, 105] = 3.58, $\underline{p} < .01$). The standardized beta for IHLOC (ß = -.281, $\underline{p} < .01$) indicates the relationship between IHLOC and amount of alcohol consumed is negative.

A set of four separate stepwise discriminant function analyses were performed to determine the linear combination of variables (spirituality and health locus of control) to differentiate between participation in positive health promoting behaviors as distinguished by individuals self reported membership in health behavior groups. Individuals self-reported how often they participated in physical activity (less than once a week to more than 3 times per week), whether they engaged in cigarette smoking behavior (never smoked to continue to smoke), whether they engage in eating high cholesterol foods (yes, no), and whether they engage in eating high fiber foods on a daily basis (yes or no). The Wilk's stepwise method was used to minimize the Wilk's lambda for the single discriminant function.

A stepwise discriminant function analysis was performed using two spirituality variables and the health locus of control variables as predictors of membership in three physical activity groups (less than once a week, 1-2 times a week, or at least 3 times per week). A stepwise discriminant function analysis was performed entering the SIBS scores (internal, external) and the health locus of control scores (internal, powerful others, chance). In order to ensure entry of important variables, a more liberal probability of F to enter of .15 was chosen (Costanza & Afifi, 1979). Table 6 presents means and standard deviations of the predictor variables as a function of physical activity level. Using physical activity as the criterion variable, one step was performed to achieve the combination of predictors that separate the groups. Internal spirituality entered in the first step generated one significant discriminant function ($F = 3.11$, $p < .05$) with a significant chi-square (X^2 (2, N = 109) = 6.06, $p < .05$). The overall accuracy rate was 56.3% in classification of physical activity groups when 39% would have been accurately classified by chance.

A stepwise discriminant function analysis was performed entering SIBS scores (internal, external) and the health locus of control scores (internal, powerful others, chance) as predictors of three groups of cigarette smoking (never smoked, used to smoke, still smoke). Using the liberal F to enter of .15 no significant function was generated.

A stepwise discriminant function analysis was performed entering SIBS scores (internal, external) and the health locus of control scores (internal, powerful others, chance) as predictors of engaging in eating high fiber foods (yes, no). No significant function was generated.

A stepwise discriminant function analysis was performed entering SIBS scores (internal, external) and the health locus of control scores (internal, powerful others chance) as predictors of two groups of eating high cholesterol foods (yes, no). Using the eating high cholesterol foods as the criterion variable, three separate steps were performed to achieve the combination of predictors that separate the groups. CLOC entered in the first step generated a significant F ($\underline{F} = 8.475$, $\underline{p} < .01$). IHLOC was entered in the second step and generated a significant F ($\underline{F} = 6.437$, $\underline{p} < .01$). Internal spirituality was entered in the last step of the function and generated a significant F ($\underline{F} = 5.046$, $\underline{p} < .01$). The chi-square produced was also significant ($X^2(3, N=113) = 14.240$; $\underline{p} < .01$). The predictor variables, Wilk's ?, and equivalent F's are presented in Table 7. The overall accuracy rate of classification of eating high cholesterol foods based on these three predictor variables was 69% where 52.5% would have been classified by chance.

A step-wise discriminant function analysis was performed entering SIBS scores (internal, external) and health locus of control scores (internal, powerful others, chance) as predictors of group membership of three levels of overall health rating (fair, good, excellent). Using the overall health as the criterion variable two separate steps were computed. IHLOC was entered in the first step and generated a significant F ($\underline{F} = 5.332$, $\underline{p} < .01$), and a significant chi-square ($X^2(2, N = 107) = 16.653$; $\underline{p} < .01$). CHLOC was entered in the second step and generated a significant F ($\underline{F} = 4.310$, $\underline{p} < .01$) and generated a significant chi-square ($X^2(2, N=107) = 5.797$, $\underline{p} < .05$). The predictor variables, Wilk's ?, and equivalent F's are presented in Table 8. The overall correct

classification of reported level of overall health based on these two predictor variables was 63.6% where chance alone would have correctly classified 45.1%.

Test of Hypothesis Three: Regression Analysis

Hypothesis three stated having an external spirituality and an external health locus of control would not be associated with participating in positive health behaviors. Hierarchical multiple regression was computed with amount of alcohol consumed per week as the dependent variable and the SIBS and MHLOC as the independent variables. External SIBS and external HLOC (powerful others, chance) were entered as the first step (R^2 = .08, p < .05) (see Table 9). POHLOC score provides unique variance to the regression equation (F [3.107] = 2.96, p < .05). Next, internal SIBS and IHLOC were included and provided a significant increase in the regression equation (? R^2 = .067, p < .05). Adding IHLOC provides unique variance over and above the POHLOC (F [5, 105] = 3.53, p < .01). The standardized beta for POHLOC (ß = -.257, p < .05) and for IHLOC (ß = -.254, p < .05) indicates the relationship between POHLOC, IHLOC and amount of alcohol consumed is negative. The overall observed variance with all variables entered is 6.7%.

Hierarchical multiple regression was computed between Spirituality regression components and MHLOC scores as the independent variables and amount of alcohol consumed per week as the dependent variable. External spirituality regression component and external HLOC (powerful others, chance) scores were entered as a first step (R^2 = .077, p < .05) (see Table 9). This step accounted for 8% of the observed variance. Next, the internal spirituality regression component and the IHLOC were

included and provided a significant increase in the regression equation (? R^2 = .068, p < .05). The HLOC scores (POHLOC, IHLOC) provide unique variance to the regression equation (F [5, 105] = 3.58, p < .01). The standardized beta for POHLOC (ß = -.261, p < .05) and for IHLOC (ß = -.281, p, < .01) indicates the relationship between POHLOC and IHLOC and amount of alcohol consumed is negative. Overall observed variance with all variables entered in the equation is 6.8%

Test of Hypothesis Four: Regression Analysis

Hypothesis four stated having an internal spirituality and an internal health locus of control would be associated with being physically healthier as rated by cholesterol levels, body mass index (BMI), and blood pressure. Hierarchical multiple regression was computed with Body Mass Index (BMI) as the dependent variable and SIBS, and MHLOC as the independent variables. Internal SIBS and IHLOC were entered in the first block (R^2 = .037, p > .05) (see Table 10). Next, the external SIBS, the POHLOC, and CHLOC were included. This step did not provide a significant increase in the strength of the regression equation (? R^2 = .028, p > .05). Adding the external SIBS, POHLOC and CHLOC accounts for only 3 % of the observed variance for BMI scores.

Hierarchical multiple regression was computed with Body Mass Index (BMI) as the dependent variable and the Spirituality regression component, and the MHLOC (internal, powerful others, chance) as the independent variables. Internal spirituality regression component and IHLOC were entered in the first block (R^2 = .33. p > .05) (see Table 10). External spirituality regression component, POHLOC, and CHLOC were

entered in the next step (? $\underline{R^2}$ = .017, $\underline{p}$ > .05). The spirituality and health locus of control measures account for only 2% of the observed variance for the BMI scores.

Hierarchical multiple regression was computed with Total cholesterol as the dependent variable and SIBS, and Multidimensional Health locus of control scores (internal, powerful others, chance) as the independent variables. Internal SIBS and IHLOC were entered in the first block ($\underline{R^2}$ = .087, $\underline{p}$ > .05) (see Table 11). External SIBS, POHLOC, and CHLOC were included in the next step. This step did not provide a significant increase in the strength of the regression equation (? $\underline{R^2}$ = .080, $\underline{p}$ > .05). Including the external measures (SIBS, PHLOC, CHLOC did not contribute any unique variance to this equation and accounted for 8% of the observed variance in total cholesterol scores.

A hierarchical multiple regression was computed between total cholesterol as the dependent variable and the spiritual regression component and Multidimensional Health Locus of Control scores (internal, powerful others, chance) as the independent variables. Internal spirituality score and IHLOC were entered in the first block ($\underline{R^2}$ = .076, $\underline{p}$ > .05)(see Table 11). The external spiritual regression component, POHLOC and CHLOC were included next but did not provide a significant increase in the strength of the regression equation (? $\underline{R^2}$ = .078, $\underline{p}$ > .05). See Table 11 for R^2, ? R^2, ?F, significant ?F, and standardized Beta coefficients for the regression.

Hierarchical multiple regression was performed between triglyceride level as the dependent variable and SIBS (internal, external), health locus of control (internal, powerful others, chance) variables as the independent predictors. The SIBS (internal)

and IHLOC were entered in the first block of the equation (R^2 = .001, p> .05) (see Table 12). The external SIBS, POHLOC, and CHLOC were included next. This step did not provide a significant increase in the strength of the regression equation (? R^2 = .041, p > .05). The overall observed variance with all variables entered is 4%.

Hierarchical multiple regression was computed between triglyceride level as the dependent variable and Spiritual regression component score (internal, external) and Multidimensional Health locus of control as the independent predictors. The internal spirituality component scores and the IHLOC were entered in the first block (R^2 = .034, p > .05) (see Table 12). Next, external spirituality score, POHLOC, and CHLOC were included in the regression equation. This step did not provide a significant increase in the strength of the equation (? R^2 = .061, p > .05). The inclusion of the external measures accounted for 6% of the observed variance in the triglyceride scores.

A stepwise discriminant function analysis was performed using spirituality and health locus of control as predictors of membership in three blood pressure groups (optimal-normal blood pressure, high normal blood pressure, hypertensive blood pressure). Using blood pressure group as the criterion variable, a stepwise discriminant function entering SIBS scores (internal, external) and health locus of control scores (internal, powerful others, chance) resulted in CHLOC generating a significant function (F = 4.68, p < .05) and generated a significant chi-square (X^2 (2, N =114) = 8.98, p < .05). Table 13 presents means and standard deviations of the predictor variables as a function of blood pressure group. The hypertensive group differed from the optimal-normal blood pressure group and the high normal blood pressure group on the chance

health locus of control variable, F (2, 111) = 4.68, p < .05. The predictor variables, Wilk's ?, and equivalent F's are presented in Table 14. The overall accuracy of classification of blood pressure group based on knowing CHLOC score was 72.8% where 57.56% would have been classified by chance.

Test of hypothesis five: Regression Analysis

Hypothesis five stated that a significant synergistic association between internal health locus of control and internal spirituality would be associated with participation in positive health behaviors. A new variable was computed. This new variable was the product of the IHLOC score and the Internal SIBS score. A hierarchical multiple regression was computed between Spirituality scores (internal, external), the health locus of control scores (internal, powerful others, chance) and the product of IHLOC and internal SIBS. The SIBS scores and the MHLOC scores were entered as the first step (R^2 = .144, p < .01). This initial step accounted for 14.4% of the observed variance in the amount of alcohol consumed. The health locus of control scores (POHLOC, IHLOC) provides unique variance over and above the other measures (F [5,105] = 3.53, p < .01). Next, the IHLOC and Internal SIBS product score was included but did not provide a significant increase in the regression equation (? R^2 = .01, p > .05).

A stepwise discriminant function analysis was performed using the spirituality variable scores (internal, external), the health locus of control scores (internal, powerful others, chance) and the product of the IHLOC and the Internal SIBS as predictors of membership in three physical activity groups (less than once a week, 1-2 times per week, at least 3 times per week). Results using physical activity level, as the criterion

variable did not generate a significant discriminant function or significant chi-square based on addition of the IHLOC/internal SIBS product score. Table 15 presents means and standard deviations of the predictor variables as a function of physical activity level.

A stepwise discriminant function analysis was performed using the spirituality (internal, external) scores, the health locus of control scores (internal, powerful others, chance), and the IHLOC/internal SIBS product score as predictors of membership in cigarette smoking behavior groups (never, used to smoke, still smoke). Results found no significant discriminant function or chi-square was generated in the analysis.

A stepwise discriminant function analysis was performed using the spirituality (internal, external) scores, the health locus of control scores (internal, powerful others, chance) and the IHLOC/internal SIBS product score to determine if the addition of those high on IHLOC and internal spirituality would predict membership in eating high fiber foods (yes, no). Results using eating high fiber foods as the criterion variables did not generate a significant discriminant function or chi-square analysis.

A stepwise discriminant function analysis was performed using spirituality scores (internal, external), health locus of control scores (internal, powerful others, chance) and the product score of IHLOC and internal SIBS as the predictors and eating high cholesterol foods (yes, no) as the criterion. Two separate steps were performed. The product score of IHLOC and internal spirituality was entered in the first step and generated a significant F($\underline{F}$ = 11.751, $\underline{p}$ < .01). CHLOC was entered in the second step and generated a significant F ($\underline{F}$ = 7.668, $\underline{p}$ < .01). A significant chi-square was also generated (X^2(2, N = 111) = 14.36, $\underline{p}$ < .01). The predictor variables, Wilk's ?, and

equivalent F's are presented in Table 16. The overall accuracy rate of classification of eating high cholesterol foods based on these two predictor variables was 69% where 52.93% would have been classified by chance.

Finally, a stepwise discriminant function analysis was performed using the predictors of spirituality (internal, external), health locus of control (internal, powerful others, chance) and the product score of IHLOC and internal SIBS and overall health rating (poor, fair, good, excellent) as the criterion variable. A significant discriminant function analysis with one step was generated. The product score of the IHLOC and internal SIBS was entered in the first step and generated a significant F ($F = 3.63$, $p < .05$) and generated a significant chi-square (X^2 (3, N=108) = 10.43, $p < .05$). Table 17 presents the predictor variables, Wilk's ?, and equivalent F values. The overall accuracy rate was 59.8% were correctly classified where 43.48% would have been classified by chance.

CHAPTER FIVE

DISCUSSION

Summary and integration of results

The purpose of the current study was to examine the relationship between spirituality, health locus of control, and participation in health promoting behaviors. Additionally, the study examined the relationship between spirituality, health locus of control, and physical health measures including cholesterol level, body mass index, and blood pressure.

In the current study health-promoting behaviors consisted of lifestyle behaviors including participation in physical activity, alcohol consumption, self-reported cigarette smoking, dietary influences (eating high fiber food, eating high cholesterol food). Physical health was measured as a function of total cholesterol, triglyceride level, body mass index (computed from height and weight), and blood pressure readings. Additionally, self-rating of overall health was included in the analysis to evaluate if those who reported operating from a more internal spirituality and/or from a more internal health locus of control would report a more positive overall health rating. Prior research (McBride et al., 1998) found a relationship between internal spirituality and overall health ratings.

The spirituality and health research has concentrated primarily on the relationships between spirituality and health in medical populations (Anandarahah & Hight, 2001; Astrow, Puchalski, & Sulmasy, 2001; Jenkins and Pargament, 1995; Kim,

Heinemann, Bode, Sliwa & King, 2000). Religious involvement (attending church services) has been found to show strong correlation with lower blood pressure (Hixson, Grochow, & Morgan, 1998; Koenig & George, 1998) for individuals 65 years or older. Religiosity and religious commitment has been found to impact ability to cope with and manage hypertension among African Americans (Brown, 2000). Additionally, the dimensions of religiosity most influential on blood pressure were "intrinsic religiosity" and "religious coping" (Hixson et al., 1998).

The health locus of control research has found inconsistent results of the impact of health locus of control on health and health behaviors (Carlson & Petti, 1989; Wurtele, Britcher, and Saslawsky, 1985). The current study looked at whether a combination of spirituality and health locus of control would predict participation in positive health promoting behavior as well as physical health measures.

The primary hypothesis stated internal spirituality would have a positive relationship with internal health locus of control and would be positively associated with participating in positive health promoting behaviors. The results of correlations suggested marginal relationships existed between internal spirituality and internal health locus of control. Those who viewed themselves as being more internally spiritual reported a more active role in their health and well-being. Furthermore, there was a positive relationship with participation in positive health promoting behaviors. Having an internal health locus of control was inversely related to negative health behaviors such as amount of alcohol consumed and eating high cholesterol foods. Thus, those who ascribed to an internalized health locus of control engaged in more proactive behavior

and were more responsible for their health. Thus they engaged in more positive health behavior such as limiting alcohol intake and high cholesterol foods.

Health locus of control has been found to influence such health behaviors as breast self-exam (Bundek, Marks, & Richardson, 1993) and participation in physical activity (Carlson & Petti, 1989). However, other research has found inconsistent and less conclusive evidence for health locus of control's influence on health related behaviors (AbuSabha & Acterberg, 1997). The current study found an association between those individuals who believe their health is controlled by external influences (either powerful others such as physicians, family members, or fate) and being less likely to engage in positive health behaviors. Previous research (Richardson, Graham, & Levin, 1986; Wallstein et al., 1978 cited in Bundek, Marks, & Richardson, 1993) reported strong correlations between chance health locus of control and powerful others health locus of control. Results from the current study found similar relationships. Scores on the powerful others health locus of control were positively associated to chance health locus of control. Having a chance health locus of control was positively associated with consumption of high cholesterol foods and positively associated to having an elevated blood pressure. This is suggestive that individuals operating from the perspective that their health is based on fate and nothing they do will have an impact are more likely to engage haphazardly in positive health promoting behaviors or not at all.

The spirituality research has found relationships between level of spirituality and health for a variety of populations including those afflicted by HIV/AIDS (Hall, 1998) and terminally ill hospitalized adults (Reed, 1987). The current study provides support

that internal spirituality has a positive relationship with participation in health promoting behaviors such as engaging more often in physical activity, limiting their consumption of high cholesterol foods and having an optimal/normal blood pressure.

Hypothesis two predicted that an internal spirituality paired with an external health locus of control would not be associated with participating in positive health promoting behaviors however, an external spirituality paired with an internal health locus of control would be associated with participating in positive health behaviors. This was not supported in the current research. The numbers of empirical studies, which focus on external health locus of control's influence on health behaviors, are minimal and results are inconsistent. Martinelli (1999) found female college student with increased self-efficacy, who avoided tobacco smoke and who had both a powerful external and internal health locus of control participated in the most effective health promotion behaviors. Holm, Frank, and Curtin (1999) found no evidence supporting health locus of control as predictive of women's health behavior specifically related to obtaining a mammography. The results from the current study found an inverse relationship between powerful others health locus of control and amount of alcohol consumed. Powerful others health locus of control was only significant when looking at amount of alcohol consumed. Powerful others showed no effect in its relationship to physical measures of health such as body mass index, cholesterol level, or blood pressure reading. Additionally, powerful others had no impact in determining positive health promoting behaviors such as physical activity level or dietary influences (eating high cholesterol foods, eating high fiber foods).

The third hypothesis stated having an external spirituality and an external health locus of control would not have an association with participating in positive health behaviors. The only health behavior impacted by the external health locus of control scales was alcohol consumption, which was negatively associated with amount of alcohol consumed per week.

Fourth hypothesis stated having an internal spirituality and an internal health locus of control would be associated with being physically healthier as rated by cholesterol levels, body mass index (BMI), and blood pressure. No relationship was found between self-reported spirituality or health locus of control and these physical health measures. The results found no support for this hypothesis.

Finally, the fifth hypothesis stated the combination of internal spirituality and internal health locus of control would have a synergistic association and be associated with participation in positive health behaviors. The hypothesis was supported only for the ability to discriminate between those who reported eating high cholesterol foods. Having high internal spirituality combined with having high internal health locus of control was found to be one predictor, along with chance health locus of control, which would be able to classify individuals based on participation in eating high cholesterol food.

Results from the current study also found that combining internal spirituality with internal health locus of control was able to discriminate individuals overall health rating. Previous research has found individuals who are more spiritual often will report higher

quality of life (Kim, Heinemann, Bode, Sliwa & King, 2000). This may be expressed by reporting a higher rating for their overall health.

Previous research (Hall, 1998; Kass et al., 1991; Michello, 1988;) has evaluated level of spirituality on health and health behaviors primarily in either medical based population or a college student population. The current research data is based on information obtained from a primarily "healthy" sample of employees working for a relatively large organization. The findings indicated a relationship between individuals who describe themselves as internally spiritual and operating from an internal health locus of control. There was only a marginal relationship between level of spirituality and participation in positive health promoting behaviors.

Implications of findings

This current information has implications for designing health promotion interventions and programming. Determining spirituality's level of impact on positive health behaviors when designing and implementing health promotion endeavors is of importance. There has been an upsurge of interest and empirical research on the impact of spirituality and health and wellness (Benson, 1996; Levin, 2001). Additionally, the medical field is beginning to recognize the importance of spirituality in the overall care of patients (Cairns, 1999; Kavanaugh, 1996-97; Levin, Larson, Pulchaski, 1997; Levin, 2001; Sloan, Bagiella, Powell, 1997; Waldfogel, 1997). Martinelli's (1999) research suggested potential for designing health promotion interventions specifically to shape college students smoking behavior.

Furthermore, understanding an individual's level of health locus of control may impact participation level in health promotion and wellness programming. Achterburg and Lawlis (F. McManimen, personal communication, April, 2001) found individuals who reported both a high internal health locus of control and a high powerful others health locus of control would seek out help, however, they showed a tendency to discount or have difficulty following through with suggestions offered. Sobel (1995) suggests beliefs and attitudes, such as locus of control or a sense of self-efficacy and self-control are determinants of health behaviors. Others (Ornstein & Sobel, 1987 cited in Sobel, 1995; Bandura, 1991 cited in Sobel, 1995) propose these beliefs have direct impact on physiological systems outside of their effect on health behavior. the Faith Factor described by Benson (1996) is a combined force of these internal influences (individual beliefs and attitudes). He found individuals incorporating these beliefs and attitudes had a direct impact in eliciting the relaxation response. Currently, research being conducted by Wallstein (cited in Levin, 2001) includes development and validation of a scale to assess people's beliefs about the role of God in their health.

Implications for data would be for development of health promotion and wellness programming efforts within and organization. Clearly, being able to identify those individuals who operate from the perspective that they have a role in maintaining their health and well being is just as important as identifying individuals who look to "powerful others" to keep them healthy. Sobel (1995) suggests that one can improve health and reduce health care costs by helping individuals to care for themselves. Clearly being able to identify individuals operating from the perspective they are in control of

their health and well-being has value. Likewise, identifying individuals operating from the standpoint that "others" control their health could drive the development of intervention strategies. These strategies could be tailored to educate more effectively in self-care behaviors. Clearly, this information would impact the methods and strategies used when organizations attempt to implement and increase participation in wellness programs.

Limitations

The current study is limited as a function of the current study sample. Participants exhibited low participation in following through with engaging in the cholesterol screening. It is plausible there are differences between individuals who purchased the screening vouchers and followed through with the cholesterol screening versus individuals who purchased the vouchers and failed to follow through with the screening. Perhaps only those high on internal health locus of control purchased the voucher. Furthermore, due to the low N in the cholesterol screening, it is possible a more significant turnout would have resulted in finding differences in the cholesterol levels between those who describe themselves as more internally spiritual or having an internal health locus of control.

The current study combined male and female participants scores on the current measures (Spirituality and health locus of control) without separating out by gender. In the current sample gender was marginally associated with blood pressure and hdl cholesterol scores. Prior studies (Oleckno & Blacconiere, 1991) found greater wellness among women versus men. The current sample is composed of 76 (66%) female

participants. This may have impacted the findings on the reported health behaviors. However, research findings reported by Levin (2001, p 6) consistently:

> identify significant religious or spiritual effects on rates of health and illness regardless of the age, sex, race ethnicity, nationality, or religious denomination of the people studied, and independent of the study design used and of where and when these studies took place.

The measurement device used to assess health behaviors has been used to assess health risk based on participation in a number of health related behaviors. Health behaviors such as dietary behavior (eating high cholesterol foods or eating high fiber foods) and physical activity were scored either as participating or not participating or as engaging in one of three levels, respectively. A general picture of how often one participates in physical activity was obtained. Perhaps when primarily healthy individuals are studied rather than a global rating, such as how often they participate in physical activity, using more stringent descriptive criteria, such as type of activity and endurance level, would provide greater ability to discriminate and detect true effects. Prior research (Carlson & Petti, 1989) has further broken down exercise into more specific categories, which can be rated by caloric expenditure.

The current spirituality measure divides spirituality into four separate categories. However, only two (internal, external) were included in the current study. In the current sample the external spirituality subscale and internal spirituality subscale were significantly positively correlated. This may indicate that spirituality is a uni-dimensional construct. Prior studies have suggested that religiosity is a multi-

dimensional construct (King, 1990). However, there has been difficulty discriminating between religiosity and spirituality. Prior spirituality measures were developed from a "Judeo-Christian" influence (Hall, Tisdale, & Brokaw, 1996). The Spiritual Involvement and Beliefs Scale (SIBS) was specifically developed (Hatch et al., 1998) to identify involvement and beliefs related to spirituality without a Judeo Christian influence. However, the measure clearly distinguishes between a more ritualized involvement in behaviors (prayer) and a more internalized belief (in a higher power). Ellison and Levin (1998) describe the importance of healthy beliefs on health status. Additionally, Dossey (1993) presented information how patients and physicians cognitive expectations can influence the prognosis, therapeutic efficacy, course of treatment and clinical endpoint (i.e. recovery, mortality). There is evidence to support the concept of the role we play in our health.

Ellison and Levin (1998) suggest a crucial element in the empirical literature is conceptualization and measurement of religious involvement. They propose the current literature is limited in its ability to discern differences between behavioral and functional determinants of religious involvement. It is possible that there is a difference between behavioral and functional spiritual involvement. The SIBS was developed to assess both spiritual involvement and beliefs however, it is plausible the SIBS measure is not designed to discern between behavioral and functional determinants of spirituality. Perhaps there is an interactional effect between religiosity and spirituality.

The Multidimensional Health Locus of Control Scale (Wallstein et al., 1978) has been used to measure health beliefs especially regarding engaging in health behaviors.

There are inconsistencies in the impact of health locus of control and its ability to distinguish participation in health behaviors (AbuSabha & Acterberg, 1997; Carlson & Petti, 1989; Wurtele et al., 1985). It is possible for individuals to respond in such a manner that their scores are elevated on more than one subscale. Prior research by Achterberg and Lawlis (F. McManimen, personal communication, April, 2001) suggests individuals who respond with elevated scores on internal and powerful others health locus of control seek out treatment but fail to follow through. This may have impacted the findings from the current research.

Future directions

This information has importance in furthering the understanding of the role of spirituality in health and wellness. Future research sparked by the results from the current study includes further constructing a framework to empirically understand spirituality (involvement and beliefs) and their impact on health behaviors, lifestyle behaviors, and coping strategies. There is evidence that church attendance lowers blood pressure (Koenig & George, 1998). Levin (2001) reported significant numbers of empirical studies on the positive benefits of participating in religious/spiritual activities. There are significantly fewer studies that have focused on religious beliefs on physical health. Although the current interest in spirituality has radically increased over the last two decades, the ability to empirically study spirituality has been impacted by the difficulty to operationally define and differentiate the construct labeled spirituality. Is there an interaction between religiosity and spirituality?

Is there a difference in those who engage in more spiritual beliefs/attitudes versus involvement in spiritual activities? Is there a way to isolate specific spiritual beliefs and attitudes? The literature suggests individuals clearly differentiate spirituality and religion (Hall, 1998) yet verbally identify spirituality by referring to a higher power or God. Benson (1996) has proposed that we are "hardwired" for God. This personal faith factor influences our participation in beliefs and behaviors, which according to Benson can precipitate physiological changes in our biological system which can ultimately impact our state of health. Levin (2001) reports on research which found having a higher intrinsic religiosity is positively connected to having the ability to enter altered states of consciousness, such as a hypnotic state, and altering physiological states such as heart rate, blood pressure, and skin temperature. Thus, having the ability to exert control over one's physiological states can positively affect one's level of health.

Sobel (1995) discussed lowering health care costs by improving individual "self-care" He described the Stanford Arthritis Center's experiments (Lorig et al, cited in Sobel, 1995). The center designed an arthritis self-management course to assist patients cope better with their arthritis. Findings indicated individuals experiencing enhanced self-control regarding their arthritis improved over those not experiencing enhanced self-control. Chopra (1987) describes the importance of the interconnection of our thoughts and beliefs in the physiological mechanisms in the body. As medicine and the lay public continue to recognize the importance of this interconnection between our perceptions, thoughts, beliefs, and attitudes in our health and well being it will be important to

continue to identify methods and design interventions to increase self-efficacy and encourage individuals to be more active in their health and healthcare.

Summary

In summary, the current research has attempted to replicate previous research findings on the relationship between spirituality, health locus of control and health behavior and physical health. Although, the findings are suggestive that a relationship exists between spiritual beliefs and positive health promoting behaviors the findings are inconsistent and did not include all health promoting behaviors. Additionally, current findings provide limited support for the association of internal health locus of control and engaging in positive health promoting behaviors. Furthermore, the current results take the research one step further and look at the combination of internal spirituality and internal health locus of control as it affects health behaviors and health. Again, the results suggest inconsistent relationships of those reporting having a high internal spirituality and internal health locus of control and participating in positive health behaviors. A relationship was found in having both internal spirituality and internal health locus of control on predicting overall health rating.

Religion and spirituality's connection to health and healthcare is becoming a significant social, ethical and practical element (Astrow, Puchalski, & Sulmasy, 2001) along with becoming essential components of medical education (Levin et al., 1997). The National Institutes for Healthcare Research (NIHR) have developed a program to further collaborate with medical schools desiring to educate and train medical students and residents in the importance spirituality and religiosity has on direct patient care

(Levin, 2001). Spirituality and religion in the medical arena has shifted from being tossed aside and considered as unimportant to being recognized as playing a vital and viable role in the healthcare of patients. Therefore, the continued efforts to further develop and validate measures, which will increase knowledge and scientific understanding will be increasingly important.

Table 1

Descriptive Features of Study Measures

Measure	M	S D	Skewness	Kurtosis	Alpha (a)
Age	41.12	11.32	-.04	-1.00	
Triglyce	127.15	83.09	1.38	1.61	
Totlchol	177.49	30.70	.039	-1.01	
Hdlchol	44.96	12.59	.44	-.25	
Ldlchol	108.17	29.72	.42	-.56	
Ldlhdl	2.63	1.10	.66	-.24	
Cigarette Smoking	.63	.74	.73	-.83	
Overall Health	3.11	.68	-.49	.541	
Physical Activity Level	1.29	.70	-.47	-.88	
Eat High Fiber Foods	.87	.34	-2.18	2.80	
Eat high cholesterol foods	.61	.49	-.46	-1.82	
Body Mass Index	27.28	5.89	1.08	1.12	
INTRNL	28.04	5.23	-1.03	1.64	.76
PWRFUL	16.78	5.63	.41	-.14	.62
CHNCE	14.96	5.23	.17	-.77	.61
Alcamt	28.04	63.76	4.85	27.78	
Blood pressure	.34	.61	1.60	1.44	
Hdlrsk	2.11	.70	-.15	1.61	
Ldlhdrsk	.67	.52	-.22	-.88	
External SIBS	33.93	7.20	-.74	-.17	.92
Internal SIBS	28.01	4.15	-.25	-.63	.85
REGR component score (external/ritual spirituality)		1.00	-.65	-.47	
REGR component score (internal/fluid spirituality)		1.00	-.10	-.60	

Note: INTRNL=Internal Health Locus of Control; PWRFUL = Powerful Others Health Locus of Control; CHNCE = Chance Health Locus of Control; Alcamt = Amount of Alcohol consumed per week; Hdlrsk = Heart disease risk based on Hdl Cholesterol levels; Ldlhdrsk = Heart disease risk based on hdl/ldl ratio score; SIBS = Spiritual Involvement and Beliefs Scale (Internal versus external); REGR = Factor component score for the spirituality scale

Table 2

Factor Loadings from Principal-Components Analysis:

Communalities, Eigenvalues, and Percentages of Variance

SIBS Item	Factor Loading		Communality
	1	2	
24. During the last week I prayed…	**.80**		.65
17. I have a personal relationship with a power greater than myself	**.75**	.26	.63
9. Prayers do not really change what happens	**.72**	.14	.54
7. A spiritual force influences the events in my life	**.69**	.36	.60
3. A person can be fulfilled without pursuing an active spiritual life	**.69**	.14	.49
22. I solve my problems without using spiritual resources	**.69**	.24	.53
26. Last month I participated in spiritual Activities with at least one other person….	**.65**	.00	.42
12. I believe there is a power greater than myself	**.55**	.39	.46
10. Participating in spiritual activities helps me forgive other people	**.54**	.35	.41
1. In the future science will be able to explain everything	**.41**	.27	.25
	.41	.27	.25
16. Meditation does not help me feel more in touch with my inner spirit	.00	**.72**	.52
11. My spiritual beliefs continue to evolve	.36	**.71**	.63
13 I probably will not re-examine my spiritual beliefs	.00	**.62**	.39
15. Spiritual activities have not helped me develop my identity	.49	**.52**	.51
8. My life has purpose	.32	**.47**	.33
2. I can find meaning in times of hardship	.38	**.40**	.30
Eigenvalues	6.38	1.29	
% of Variance	39.85	8.05	

Table 3

Intercorrelations for Gender, Age, Health locus of control, Spirituality, Health, and Health Behavior variables

Measure	Gender	Age	IHLOC	POLOC	CLOC	RF1	RF2	PA	BMI	HiCh
1. Gender	1.00									
2. Age		1.00								
3. IHLOC			1.00							
4. POLOC			-.26 (.005)	1.00						
5. CLOC			.28 (.002)	.37 (.000)	1.00					
6. RF1						1.00				
7. RF2			.27 (.004)				1.00			
8. PA							.20 (.03)	1.00		
9. BMI								-.23 (.02)	1.00	
10. HiCh			-.26 (.006)		.26 (.005)		-.24 (.01)	-.23 (.02)		1.00
11. OH			.23 (.02)				.25 (.008)	.33 (.000)	-.58 (.000)	
12. CS										
13. HiFb								.20 (.04)		
14. AA			-.19 (.04)	-.24 (.01)						
15. BP	-.31 (.001)	.22 (.02)			.22 (.02)					

Note: Only significant correlations are included. IHLOC = Internal Health locus of Control; POLOC=Powerful others health locus of control; CLOC= Chance Health locus of control; RF1= external/ritual spirituality regression score; RF2=Internal/fluid spirituality regression score; PA=Physical activity level; BMI=Body Mass Index; HiCh=Eating high cholesterol foods; OH=Overall Health rating; CS=Cigarette Smoking behavior; HiFb=Eat high fiber foods; AA=Amount of Alcohol consumed; BP=Blood pressure rating

Table 3

Intercorrelations for Gender, Age, Health locus of control, Spirituality, Health, and Health Behavior variables

Measure	OH	CS	HiFib	AA	BP	HDLRK	hdl	SpIn	SpEx
1. Gender					-.31 (.001)		.39 (.007)		
2. Age					.22 (.02)				
3. IHLOC	.23 (.02)			-.19 (.04)				.27 (.004)	
4. POLOC			-.24 (.01)						
5. CLOC								-.27 (.004)	
6. RF1								.44 (.000)	.95 (.000)
7. RF2						-.30 (.04)			
8. PA	.33 (.000)		.20 (.04)					.21 (.03)	
9. BMI	-.58 (.000)				.39 (.000)			-.19 (.05)	
10. HiCh								-.23 (.01)	
11. OH	1.00							.24 (.01)	
12. CS		1.00							
13. HiFb			1.00						
14. AA				1.00					
15. BP					1.00				
16. HDLRK						1.00			
17. hdl							1.00		
18. SpIn								1.00	.65 (.000)
19. SpEx									1.00

Note: Only significant correlations are included. IHLOC = Internal Health locus of Control; POLOC=Powerful others health locus of control; CLOC= Chance Health locus of control; RF1= external/ritual spirituality regression score; RF2=Internal/fluid spirituality regression score; PA=Physical activity level; BMI=Body Mass Index; HiCh=Eating high cholesterol foods; OH=Overall Health rating; CS=Cigarette Smoking behavior; HiFb=Eat high fiber foods; AA=Amount of Alcohol consumed; BP=Blood pressure; HDLRK=Coronary heart disease risk based on level of HDL; hdl=level of high density lipoprotein; SpIn= Internal Spirituality; SpEx= External Spirituality

Table 4

Hierarchical regression analysis summary for spirituality and health locus of control predicting amount of alcohol consumed

DV	Model	R^2	? R^2	? F	Sig. ? F	Beta
1 Alcohol Amount	1) SIBS (Int) IHLOC,	.050	.050	2.86	.062	-.123 -.158
	2) SIBS (Ext), POHLOC CHLOC	.144	.094	3.82	.012	-.064 -.312 -.001
2 Alcohol Amount	1) Regression (Int) IHLOC,	.036	.036	2.042	.135	-.016 -.186
	2) Regression (Ext) POHLOC CHLOC	.146	.109	4.478	.005	-.136 -.317 .002

Note: SIBS (Int) = Internal Spiritual Involvement and Beliefs score; SIBS (Ext) = External Spiritual Involvement and Beliefs score; IHLOC = Internal Health Locus of Control Score, POHLOC = Powerful Others Health Locus of Control Score; CHLOC = Chance Health Locus of Control Score

Table 5

Hierarchical regression analysis summary for spirituality and health locus of control predicting amount of alcohol consumed

DV		Model	R^2	? R^2	? F	Sig. ? F	Beta
1 Alcohol Amount	1)	SIBS (Int) POHLOC CHLOC	.091	.091	3.55	.017	-.174 -.264 .043
	2)	SIBS (Ext), IHLOC,	.144	.053	3.27	.042	-.064 -.254
2 Alcohol Amount	1)	Regression (Int) POHLOC CHLOC	.066	.066	2.513	.062	-.061 -.266 .080
	2)	Regression (Ext) IHLOC,	.146	.080	4.911	.009	-.136 -.281

Note: SIBS (Int) = Internal Spiritual Involvement and Beliefs score; SIBS (Ext) = External Spiritual Involvement and Beliefs score; IHLOC = Internal Health Locus of Control Score, POHLOC = Powerful Others Health Locus of Control Score; CHLOC = Chance Health Locus of Control Score

Table 6

Means and Standard Deviations of Predictor Variables as a Function of Physical Activity Level

Predictor Variable	Exercise less than once a week		Exercise 1-2 times per week		Exercise at least 3 times per week	
	M	SD	M	SD	M	SD
IHLOC	27.06	4.98	27.48	4.74	28.69	5.80
POHLOC	17.0	6.22	17.40	4.80	16.23	6.37
CHLOC	15.50	4.45	15.63	4.79	13.92	5.90
INTSPIR	27.06	4.63	27.21	3.58	29.13	4.41
EXTSPIR	32.19	5.02	34.06	7.14	34.05	7.97

Note: IHLOC = Internal Health Locus of Control; POHLOC = Powerful Others Health Locus of Control; CHLOC = Chance Health Locus of Control; INTSPIR = Internal Spirituality Score; EXTSPIR = External Spirituality Score

Table 7

Predictor Variables in Stepwise Discriminant Function Analysis for Eating High Cholesterol Foods

Step	Predictor variable	Variables in discriminant Function	Wilk's ?	Equivalent F(1,111)
1	CHLOC	1	.929	8.475*
2	IHLOC	2	.895	6.437*
3	SPIRTINT	3	.878	5.046*

*p < .01

Note: CHLOC = Chance Health Locus of Control; IHLOC = Internal Health Locus of Control; SPIRTINT = Internal Spirituality Score

Table 8

Predictor Variables in Stepwise Discriminant Function Analysis for Overall Health Rating

Step	Predictor variable	Variables in discriminant Function	Wilk's ?	Equivalent F(2,107)
1	IHLOC	1	.909	5.332**
2	CHLOC	2	.855	4.310**

*p < .05
** p < .01

Note: CHLOC = Chance Health Locus of Control; IHLOC = Internal Health Locus of Control; SPIRTINT = Internal Spirituality Score

Table 9

Hierarchical regression analysis summary for spirituality and health locus of control predicting amount of alcohol consumed

DV	Model	R^2	? R^2	? F	Sig. ? F	Beta
1 Alcohol amount	1) SIBS (Ext) POHLOC, CHLOC	.077	.077	2.963	.035	-.122 -.257 .067
	2) SIBS (Int) IHLOC	.144	.067	4.116	.019	-.080 -.254
2 Alcohol amount	1) Regression (Ext) POHLOC CHLOC	.077	.077	2.991	.034	-.125 -.261 .066
	2) Regression (Int) IHLOC	.146	.068	4.201	.018	.004 -.281

Note: SIBS (Int) = Internal Spiritual Involvement and Beliefs score; SIBS (Ext) = External Spiritual Involvement and Beliefs score; IHLOC = Internal Health Locus of Control Score, POHLOC = Powerful Others Health Locus of Control Score; CHLOC = Chance Health Locus of Control Score

Table 10

Hierarchical regression analysis summary for spirituality and health locus of control predicting Body Mass Index(BMI)

DV	Model	R^2	? R^2	? F	Sig. ? F	Beta
1 Body Mass Index	1) SIBS (Int) IHLOC	.037	.037	2.121	.125	-.200 .040
	2) SIBS (Ext) POHLOC, CHLOC	.065	.028	1.084	.359	.169 .104 .009
2 Body Mass Index	1) Regression (Int) IHLOC	.033	.033	1.909	.153	-.189 .035
	2) Regression (Ext) POHLOC, CHLOC	.050	.017	.637	.593	.019 .118 .038

Note: SIBS (Int) = Internal Spiritual Involvement and Beliefs score; SIBS (Ext) = External Spiritual Involvement and Beliefs score; IHLOC = Internal Health Locus of Control Score, POHLOC = Powerful Others Health Locus of Control Score; CHLOC = Chance Health Locus of Control Score

Table 11

Hierarchical regression analysis summary for spirituality and health locus of control predicting Total cholesterol level

DV	Model	R^2	? R^2	? F	Sig. ? F	Beta
1 Total Cholesterol Level	1) SIBS (Int) IHLOC	.087	.087	2.105	.134	-.106 -.260
	2) SIBS (Ext) POHLOC, CHLOC	.168	.080	1.317	.282	-.325 .135 .133
2 Total Cholesterol Level	1) Regression (Int) IHLOC,	.076	.076	1.821	.174	.010 -.278
	2) Regression (Ext) POHLOC, CHLOC	.154	.078	1.254	.303	-.194 .106 .109

Note: SIBS (Int) = Internal Spiritual Involvement and Beliefs score; SIBS (Ext) = External Spiritual Involvement and Beliefs score; IHLOC = Internal Health Locus of Control Score, POHLOC = Powerful Others Health Locus of Control Score; CHLOC = Chance Health Locus of Control Score

Table 12

Hierarchical regression analysis summary for spirituality and health locus of control predicting Triglyceride level

DV	Model	R^2	? R^2	? F	Sig. ? F	Beta
1 Triglyceride level	1) SIBS (Int) IHLOC,	.001	.001	.023	.977	-.007 -.031
	2) SIBS (Ext) POHLOC, CHLOC	.043	.041	.577	.633	.171 .150 .025
2 Triglyceride level	1) Regression (Int) IHLOC,	.034	.034	.763	.472	-.184 -.005
	2) Regression (Ext) POHLOC, CHLOC	.095	.061	.896	.452	.222 .131 .082

Note: SIBS (Int) = Internal Spiritual Involvement and Beliefs score; SIBS (Ext) = External Spiritual Involvement and Beliefs score; IHLOC = Internal Health Locus of Control Score, POHLOC = Powerful Others Health Locus of Control Score; CHLOC = Chance Health Locus of Control Score

Table 13

Means and Standard Deviations of Predictor Variables as a Function of Blood Pressure Group

Predictor Variable	Optimal-Normal Blood Pressure		High Normal Blood Pressure		Hypertensive Blood Pressure	
	M	SD	M	SD	M	SD
IHLOC	27.96	5.58	28.91	4.23	25.62	3.54
POHLOC	16.78	5.79	16.26	5.84	17.88	4.02
CHLOC	14.57	5.27	14.65	5.03	20.38	4.27
INTSPIR	28.11	4.36	28.57	3.64	26.00	2.62
EXTSPIR	33.77	7.34	35.26	7.25	33.25	4.27

Note: IHLOC = Internal Health Locus of Control; POHLOC = Powerful Others Health Locus of Control; CHLOC = Chance Health Locus of Control; INTSPIR = Internal Spirituality Score; EXTSPIR = External Spirituality Score

Table 14

Predictor Variables in Stepwise Discriminant Function Analysis for Blood pressure group membership

Step	Predictor variable	Variables in discriminant Function	Wilk's ?	Equivalent F(2,111)
1	CHLOC	1	.922	4.676*

*p < .05

Note: CHLOC = Chance Health Locus of Control

Table 15

Means and Standard Deviations of Predictor Variables as a Function of Physical Activity Level

Predictor Variable	Exercise less than once a week		Exercise 1-2 times per week		Exercise at least 3 times per week	
	M	SD	M	SD	M	SD
IHLOC	27.06	4.63	27.48	4.74	28.69	5.80
POHLOC	17.00	6.23	17.40	4.80	16.23	6.37
CHLOC	15.50	4.46	15.63	4.79	13.92	5.89
INTSPIR	27.06	4.63	27.21	3.58	29.13	4.41
EXTSPIR	32.19	5.02	34.06	7.14	34.67	7.97
IHLOC/INSPIR	739.31	196.87	752.94	181.31	839.67	235.26

Note: IHLOC = Internal Health Locus of Control; POHLOC = Powerful Others Health Locus of Control; CHLOC = Chance Health Locus of Control; INTSPIR = Internal Spirituality Score; EXTSPIR = External Spirituality Score; IHLOC/INSPIR = Combined Internal Health Locus of Control and Internal Spirituality Variable

Table 16

Predictor Variables in Stepwise Discriminant Function Analysis for Eating High Cholesterol Foods

Step	Predictor variable	Variables in discriminant Function	Wilk's ?	Equivalent F(2,111)
1	HIGHHI	1	.904	11.751**
2	CHLOC	2	.878	7.668**

*p < .05
** p < .01

Note: HIGHHI = Combined Internal Health Locus of Control and Internal Spirituality Score; CHLOC = Chance Health Locus of Control Score

Table 17

Predictor Variables in Stepwise Discriminant Function Analysis for Overall Health Rating

Step	Predictor variable	Variables in discriminant Function	Wilk's ?	Equivalent F(2,111)
1	HIGHHI	1	.908	3.63*

*p < .05

Note: HIGHHI = Combined Internal Health Locus of Control and Internal Spirituality Score

APPENDIX A

SUBJECT NO. _____

Appendix
The Spiritual Involvement and Beliefs Scale

Please answer the following questions by checking your response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. In the future, science will be able to explain everything.	___	___	___	___	___
2. I can find meaning in times of hardship.	___	___	___	___	___
3. A person can be fulfilled without pursuing an active spiritual life.	___	___	___	___	___
4. I am thankful for all that has happened to me.	___	___	___	___	___
5. Spiritual activities have not helped me become closer to other people.	___	___	___	___	___
6. Some experiences can be understood only through one's spiritual beliefs.	___	___	___	___	___
7. A spiritual force influences the events in my life.	___	___	___	___	___
8. My life has a purpose.	___	___	___	___	___
9. Prayers do not really change what happens.	___	___	___	___	___
10. Participating in spiritual activities helps me forgive other people.	___	___	___	___	___
11. My spiritual beliefs continue to evolve.	___	___	___	___	___
12. I believe there is a power greater than myself.	___	___	___	___	___
13. I probably will not reexamine my spiritual beliefs.	___	___	___	___	___
14. My spiritual life fulfills me in ways that material possessions do not.	___	___	___	___	___
15. Spiritual activities have not helped me develop my identity.	___	___	___	___	___
16. Meditation does not help me feel more in touch with my inner spirit.	___	___	___	___	___
17. I have a personal relationship with a power greater than myself.	___	___	___	___	___
18. I have felt pressured to accept spiritual beliefs that I do not agree with.	___	___	___	___	___
19. Spiritual activities help me draw closer to a power greater than myself.	___	___	___	___	___

Please indicate how often you do the following:

	Always	Usually	Sometimes	Rarely	Never
20. When I wrong someone, I make an effort to apologize.	___	___	___	___	___
21. When I am ashamed of something I have done, I tell someone about it.	___	___	___	___	___
22. I solve my problems without using spiritual resources.	___	___	___	___	___
23. I examine my actions to see if they reflect my values.	___	___	___	___	___

24. During the last WEEK, I prayed. . . (check one)
- ___ 10 or more times.
- ___ 7-9 times.
- ___ 1-3 times.
- ___ 4-6 times.
- ___ 0 times.

25. During the last WEEK, I meditated. . . (check one)
- ___ 10 or more times.
- ___ 7-9 times.
- ___ 4-6 times
- ___ 1-3 times.
- ___ 0 times.

26. Last MONTH, I participated in spiritual activities with at least one other person. . . (check one)
- ___ more than 15 times.
- ___ 11-15 times.
- ___ 6-10 times.
- ___ 1-5 times.
- ___ 0 times.

SCORING INSTRUCTIONS

For positively worded items, ie, items where answers indicating agreement seem more spiritual (item numbers 2, 4, 6, 7, 8, 10, 11, 12, 14, 17, 19, 20, 21, 23): Strongly agree = 5; Agree = 4; Neutral = 3; Disagree = 2; Strongly disagree = 1.

For negatively worded items, where agreement would seem less spiritual (item numbers 1, 3, 5, 9, 13, 15, 16, 18, 22): Strongly agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly disagree = 5.

For items 24 - 26: Highest frequency category = 5; Next highest category = 4; Middle frequency = 3; Next to lowest frequency = 2; Lowest frequency = 1.

Note that this version of the scale was used only in this preliminary study. Those planning to use the scale for clinical or research purposes are encouraged to contact Dr Hatch to obtain an updated version and pertinent reliability and validity data.

APPENDIX B

MHLC

This is a questionnaire designed to determine the way in which different people view certain important health-related issues. Each item is a belief statement with which you may agree or disagree. Each statement can be rated on a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to record the number that represents the extent to which you disagree or agree with the statement. The more strongly you agree with a statement, then the higher will be the number you record. The more strongly you disagree with a statement, then the lower will be the number you record. Please make sure that you answer every item and that you record **only one** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

Please answer these items carefully, but do not spend too much time on any one item. As much as you can, try to respond to each item independently. When making your choice, do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe or how you think we want you to believe.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Slightly agree
5 = Moderately agree
6 = Strongly agree

____ 1. If I get sick, it is my own behavior which determines how soon I get well again

____ 2. No matter what I do, if I am going to get sick, I will get sick.

____ 3. Having regular contact with my physician is the best way for me to avoid illness.

____ 4. Most things that affect my health happen to be by accident.

____ 5. Whenever I don't feel well, I should consult a medically trained professional.

____ 6. I am in control of my health

____ 7. My family has a lot to do with my becoming sick or staying healthy.

____ 8. When I get sick, I am to blame.

____ 9. Luck plays a big part in determining how soon I will recover from an illness.

____ 10. Health professionals control my health.

____ 11. My good health is largely a matter of good fortune.

____ 12. The main thing which affects my health is what I myself do.

____ 13. If I take care of myself, I can avoid illness.

____ 14. When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.

____ 15. No matter what I do, I'm likely to get sick.

____ 16. If it's meant to be I will stay healthy.

____ 17. If I take the right actions, I can stay healthy.

____ 18. Regarding my health, I can only do what my doctor tells me to do

APPENDIX C

THE
CARTER CENTER
OF EMORY UNIVERSITY

No. _____

Healthier People
Health Risk Appraisal

Detach this coupon and put it in a safe place.
You will need it to claim your appraisal results.

Healthier People
Health Risk Appraisal
The Carter Center of Emory University

No. _____

Health Risk Appraisal is an educational tool. It shows you choices you can make to keep good health and avoid the most common causes of death for a person your age and sex. This Health Risk Appraisal is not a substitute for a check-up or physical exam that you get from a doctor or nurse. It only gives you some ideas for lowering your risk of getting sick or injured in the future. It is NOT designed for people who already have HEART DISEASE, CANCER, KIDNEY DISEASE, OR OTHER SERIOUS CONDITIONS. If you have any of these problems and you want a Health Risk Appraisal anyway, ask your doctor or nurse to read the report with you.

DIRECTIONS: To keep your answers confidential DO NOT write your name or any identification on this form. Please keep the coupon with your participant number on it. You will need it to claim your computer report. To get the most accurate results answer as many questions as you can and as best you can. If you do not know the answer leave it blank. Questions with a ★ (star symbol) are important to your health, but are not used by the computer to calculate your risks. However, your answers may be helpful in planning your health and fitness program.

Please put your answers in the empty boxes. (Examples: X or 125)

1. SEX		1 ☐ Male 2 ☐ Female
2. AGE		☐ Years
3. HEIGHT	(Without shoes) (No fractions)	☐ Feet ☐ Inches
4. WEIGHT	(Without shoes) (No fractions)	☐ Pounds
5. Body frame size		1 ☐ Small 2 ☐ Medium 3 ☐ Large
6. Have you ever been told that you have diabetes (or sugar diabetes)?		1 ☐ Yes 2 ☐ No
7. Are you now taking medicine for high blood pressure?		1 ☐ Yes 2 ☐ No
8. What is your blood pressure now?		☐ / ☐ Systolic (High number) / Diastolic (Low number)
9. If you *do not* know the numbers, check the box that describes your blood pressure.		1 ☐ High 2 ☐ Normal or Low 3 ☐ Don't Know
10. What is your TOTAL cholesterol level (based on a blood test)?		☐ mg/dl
11. What is your HDL cholesterol (based on a blood test)?		☐ mg/dl
12. How many cigars do you usually smoke per day?		☐ cigars per day
13. How many pipes of tobacco do you usually smoke per day?		☐ pipes per day
14. How many times per day do you usually use smokeless tobacco? (Chewing tobacco, snuff, pouches, etc.)		☐ times per day

Health Risk Appraisal is an educational tool. It shows you choices you can make to keep good health and avoid the most common causes of death for a person your age and sex. This Health Risk Appraisal is not a substitute for a check-up or physical exam that you get from a doctor or nurse. It only gives you some ideas for lowering your risk of getting sick or injured in the future. It is NOT designed for people who already have HEART DISEASE, CANCER, KIDNEY DISEASE, OR OTHER SERIOUS CONDITIONS. If you have any of these problems and you want a Health Risk Appraisal anyway, ask your doctor or nurse to read the report with you.

Your report may be picked up at _____ on _____.

15. CIGARETTE SMOKING
How would you describe your cigarette smoking habits?

1 ☐ Never smoked ☛ Go to 18
2 ☐ Used to smoke ☛ Go to 17
3 ☐ Still smoke ☛ Go to 16

16. STILL SMOKE
How many cigarettes a day do you smoke? ☛ GO TO QUESTION 18

☐ cigarettes per day ☛ Go to 18

17. USED TO SMOKE
a. How many years has it been since you smoked cigarettes fairly regularly? ☐ years
b. What was the average number of cigarettes per day that you smoked in the 2 years before you quit? ☐ cigarettes per day

18. In the next 12 months how many thousands of miles will you probably travel by each of the following? (NOTE: U.S. average = 10,000 miles)
a. Car, truck, or van: ☐,000 miles
b. Motorcycle: ☐,000 miles

19. On a typical day how do you USUALLY travel? (Check one only)
1 ☐ Walk
2 ☐ Bicycle
3 ☐ Motorcycle
4 ☐ Sub-compact or compact car
5 ☐ Mid-size or full-size car
6 ☐ Truck or van
7 ☐ Bus, subway, or train
8 ☐ Mostly stay home

20. What percent of the time do you usually buckle your safety belt when driving or riding? ☐ %

21. On the average, how close to the speed limit do you usually drive?
1 ☐ Within 5 mph of limit
2 ☐ 6-10 mph over limit
3 ☐ 11-15 mph over limit
4 ☐ More than 15 mph over limit

22. How many times in the last month did you drive or ride when the driver had perhaps too much alcohol to drink? ☐ times last month

23. How many drinks of alcoholic beverages do you have in a typical week? (Write the number of each type of drink)
☐ Bottles or cans of beer
☐ Glasses of wine
☐ Wine coolers
☐ Mixed drinks or shots of liquor

☛ *(MEN GO TO QUESTION 33)*

WOMEN

24. At what age did you have your first menstrual period? ☐ years old

25. How old were you when your first child was born? ☐ years old (If no children write 0)

26. How long has it been since your last breast x-ray (mammogram)?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
27. How many women in your natural family (mother and sisters only) have had breast cancer?	☐ women
28. Have you had a hysterectomy operation?	1 ☐ Yes 2 ☐ No 3 ☐ Not sure
29. How long has it been since you had a pap smear test?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
★ 30. How often do you examine your breasts for lumps?	1 ☐ Monthly 2 ☐ Once every few months 3 ☐ Rarely or never
★ 31. About how long has it been since you had your breasts examined by a physician or nurse?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
★ 32. About how long has it been since you had a rectal exam? *(WOMEN GO TO QUESTION 34)*	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
MEN ★ 33. About how long has it been since you had a rectal or prostate exam?	1 ☐ Less than 1 year ago 2 ☐ 1 year ago 3 ☐ 2 years ago 4 ☐ 3 or more years ago 5 ☐ Never
★ 34. How many times in the last year did you witness or become involved in a violent fight or attack where there was a good chance of a serious injury to someone?	1 ☐ 4 or more times 2 ☐ 2 or 3 times 3 ☐ 1 time or never 4 ☐ Not sure
★ 35. Considering your age, how would you describe your overall physical health?	1 ☐ Excellent 2 ☐ Good 3 ☐ Fair 4 ☐ Poor
★ 36. In an average week, how many times do you engage in physical activity (exercise or work which lasts at least 20 minutes without stopping and which is hard enough to make you breathe heavier and your heart beat faster)?	1 ☐ Less than 1 time per week 2 ☐ 1 or 2 times per week 3 ☐ At least 3 times per week
★ 37. If you ride a motorcycle or all-terrain vehicle (ATV) what percent of the time do you wear a helmet?	1 ☐ 75% to 100% 2 ☐ 25% to 74% 3 ☐ Less than 25% 4 ☐ Does not apply to me

★ 38. Do you eat some food every day that is high in fiber, such as whole grain bread, cereal, fresh fruits or vegetables?	1 ❑ Yes 2 ❑ No
★ 39. Do you eat foods every day that are high in cholesterol or fat, such as fatty meat, cheese, fried foods, or eggs?	1 ❑ Yes 2 ❑ No
★ 40. In general, how satisfied are you with your life?	1 ❑ Mostly satisfied 2 ❑ Partly satisfied 3 ❑ Not satisfied
★ 41. Have you suffered a personal loss or misfortune in the past year that had a serious impact on your life? (For example, a job loss, disability, separation, jail term, or the death of someone close to you.)	1 ❑ Yes, 1 serious loss or misfortune 2 ❑ Yes, 2 or more 3 ❑ No
★ 42a. Race	1 ❑ Aleutian, Alaska native, Eskimo or American Indian 2 ❑ Asian 3 ❑ Black 4 ❑ Pacific Islander 5 ❑ White 6 ❑ Other 7 ❑ Don't know
★ 42b. Are you of Hispanic origin such as Mexican-American, Puerto Rican, or Cuban?	1 ❑ Yes 2 ❑ No
★ 43. What is the highest grade you completed in school?	1 ❑ Grade school or less 2 ❑ Some high school 3 ❑ High school graduate 4 ❑ Some college 5 ❑ College graduate 6 ❑ Post graduate or professional degree
★ 44. What is your job or occupation? (Check only one)	1 ❑ Health professional 2 ❑ Manager, educator, professional 3 ❑ Technical, sales or administrative support 4 ❑ Operator, fabricator, laborer 5 ❑ Student 6 ❑ Retired 7 ❑ Homemaker 8 ❑ Service 9 ❑ Skilled crafts 10 ❑ Unemployed 11 ❑ Other
★ 45. In what industry do you work (or did you last work)? (Check only one)	1 ❑ Electric, gas, sanitation 2 ❑ Transportation, communication 3 ❑ Agriculture, forestry, fishing 4 ❑ Wholesale or retail trade 5 ❑ Financial and service industries 6 ❑ Mining 7 ❑ Government 8 ❑ Manufacturing 9 ❑ Construction 10 ❑ Other

V 3.0

APPENDIX D

UNIVERSITY OF NORTH TEXAS
UNT HEALTH SCIENCE CENTER AT FORT WORTH
COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS
RESEARCH CONSENT FORM

Project Title: Spirituality, Health Locus of Control, and Wellness in Organizational Health Promotion and Wellness Programs
Principal Investigator: Robert Kaman, Ph.D., JD

I, _____, agree to participate in a study of individuals involved in a Wellness program at UNT Health Science Center at Fort Worth. The purpose of this study is to evaluate the characteristics of individuals and their level of participation in Wellness programming.

As a participant, I understand that I do not need to be an active participant in Wellness programming to participate in this study. I understand that participation will be limited to a single episode consisting of two parts. I will be asked to provide information to experimental tasks by completion of forms, and questionnaires relating to my beliefs, attitudes and behaviors. Additionally I will participate by undergoing a standard cholesterol screening consisting of a one-time blood draw.

I have been informed that any information obtained in this study will be recorded with a code number that will allow the investigators to determine my identity. All personal information I provide will be kept confidential and only the investigators will have access to this information. Under this condition, I agree that any information obtained from this research may be used in any way thought best for publication or education.

I understand that the personal risk or discomfort directly involved with this research is that associated with having my blood drawn for the cholesterol screen. When blood tests are done, side effects can include pain and tenderness or bruising in the area from which the blood is drawn. There is little risk of any prolonged bleeding and/or infection at the injection site. I understand that I am free to withdraw my consent and discontinue participation in this study at any time. A decision to withdraw from the study will not affect my employment status or Wellness program services available to me.

If I have any questions or problems that arise in connection with my participation in this study, I should contact the project supervisors, Dr. Warren Watson (940) 565-3277, Dr. Robert Kaman (817) 735-2670 or Janine E. Gauthier (817) 735 - 0460 (work) or (940) 484-7552 (home). If you have any questions about your rights as a participant in this study, you may contact Dr. Jerry McGill, Chairman, Institutional Review Board, University of North Texas Health Science Center at Fort Worth at (817) 735-5483 for more information. This research has been reviewed and approved by the UNT Committee for the Protection of Human Subjects (Phone 940 565-3940).

REVIEW FOR PROTECTION OF PARTICIPANTS:

RESEARCH SUBJECTS RIGHTS: I have read or have had read to me all of the above.

_____ has explained the study to me and answered all of my questions. I have been told the risks or discomforts and possible benefits of the study.

I understand that I do not have to take part in this study, and my refusal to participate will involve no penalty or loss of benefits to which I am entitled. A decision to withdraw from the study will not affect my employment status or Wellness program services available to me. The study personnel can stop my participation at any time if it appears to be harmful to me, if I fail to follow directions for participation in the study, if it is discovered that I do not meet the study requirements, or if the study is canceled.

In case there are problems or questions, I have been told I can call Robert Kaman, J.D., Ph.D. at telephone number (817) 735-2670, Warren Watson at (940) 565-3277 or Janine Gauthier at (817) 735-0460 or (940) 484-7552.

I understand my rights as a research subject, and I voluntarily consent to participate in this study. I understand what the study is about and how and why it is being done. I will receive a signed copy of this consent form.

_____ _____

Subjects Signature Date

_____ _____

Signature of Witness Date

For the Investigator or Designee:

I certify that I have reviewed the contents of this form with the person signing above, who, in my opinion, understood the explanation. I have explained the known benefits and risks of the research.

_____ _____

Principal Investigator's Signature Date

References

AbuSabha, R. & Achterberg, C. (1997). Review of self-effecacy and locus of control for nutrition- and health related behavior. Journal of American Dietetic Association. 97, 1122-1132.

Achterberg, J. & Lawlis, F. (1990). The Health Attribution Test Manual.

American College of Sports Medicine. (2000). ACSM's Guidelines for Exercise Testing and Presciption. (6th edition). Philadelphia: Lippincott, Williams, & Wilkins.

Anandarajah, G. & Hight, E. (2001). Spirituality and medical practice: Using the HOPE questions as a practical tool for spiritual assessment. American Family Physician. 63, (1). 81-88.

Ardell,D. (1977). High Level Wellness: An Alternative to doctors, drugs, and disease. New York: Bantam Books.

Ardell, D. (1982). 14 Days to a Wellness Lifestyle. MillValley: Whatever Publishing.

Ardell, D. (1996). The book of wellness: A secular approach to spirituality, meaning and purpose. New York: Prometheus Books.

Arnink,D. (1995). Existentialism revisited. Retrieved July 28, 1999 from World Wide Web: http://www.rt66.com/~kokheong/existent.html

Astrow, A.B., Puchalski, C. M., & Sulmasy, D.P. (2001). Religion, spirituality, and health care: Social, ethical, and practical considerations. The American Journal of Medicine. 110, 283-287.

Astrup, S. J., McGovern, P.M., Kochevar, L.K. (1992). The relationship between wellness participation and health care benefit utilization. Benefits Quarterly. 8, 41-54.

Bailey, N.C. (1990). Wellness programs that work. Business and Health. 8, 28-40.

Banks, R.L., Poehler, D.L., Russell, R.D. (1984). Spirit and human-spiritual interaction as a factor in health and in health education. Journal of Health Education,15, 16-19.

Bellingham, R., Cohen, B., Jones, T., & Spaniol, L. (1989). Connectedness: Some skills for spiritual health. American Journal of Health Promotion, 4, 18-24, 31.

Benson, H.(1996). Timeless Healing: The power and biology of belief. New York: Scribner.

Bickley, L.S. (1999). Bates Guide to Physical Examination & History Taking. (7th ed.). New York: Hoekelman, Robert A. Lippincott.

Brandenburg, U.& Slesina, W. (1994). Health promotion circles: A new approach to health promotion at worksite. Homeostasis. 35, 43-48

Brown, C.M. (2000). Exploring the role of religiosity in hypertension management among African Americans. Journal of Health Care in the Poor and Underserved. 11, 1. 19-32.

Bundek, N.I., Marks, G., & Richardson, J.L. (1993). Role of health locus of control beliefs in cancer screening of elderly hispanic women. Health Psychology, 12, 193-199.

Cairns, A.B. (1999). Spirituality and religiosity in palliative care. Home Healthcare Nurse, 17, 7. 450-455.

Carlson, B.R. & Petti, K. (1989). Health locus of control and participation in physical activity. American Journal of Health Promotion, 3, 32-37.

Chandler, C.K., Holden, J.M., & Kolander, C.A. (1992). Counseling for spiritual wellness: Theory and practice. Journal of Counseling & Development. 71. 168-175.

Chapman, L. (1986). Spiritual health: A component missing from health promotion. American Journal of Health Promotion. 1. 38-41.

Chopra (1987). Creating Health: How to wake up the Body's Intelligence. Boston: Houghton Mifflin Company.

Cohen, J. (1992). A power primer. Psychological Bulletin.112,(1). 155-159.

Conners, N. (1992). Wellness promotes healthier employees. Business and Health.10, 66-71.

Costanza, M.C., & Afifi, A.A. (1979). Comparison of stopping rules in forward stepwise discriminant analysis. Journal of the American Statistical Association, 74, 777-785.

Daley, A. J. & Parfitt, G. (1996). Good health-- Is it worth it? Mood states, physical wellbeing, job satisfaction and absenteeism in members and non-members of a British corporate health and fitness club. Journal of Occupational & Organizational Psychology. 69, 121-134.

DeAvila, D.T. (1995). Existential psychology, logotherapy & the will to meaning. Retrieved June 23, 1999 from the World Wide Web: http://www.albany.net/-deavila/exist.html.

DeCrans, M (1990). Spiritual well-being in the rural elderly. Unpublished master' thesis, Marquette University. Milwaukee, Wisconsin.

Diaz, D.P. (1993). Foundations for spirituality: Establishing the viability of spirituality within the health disciplines. Journal of Health Education, 24, 324-326.

Elkins, D.N., Hedstrom, L.J., Hughes, L.L., Leaf, J.A., Saunders,C. (1988). Toward a humanistic phenomenological spirituality definition, description and measurement. Journal of Humanistic Psychology. 28, 5-18.

Ellison, C.G. & Levin, J.S. (1998) The religion-health connection: Evidence, theory, and future directions. Health Education and Behavior. 25, 6. 700-720.

Everly, G.S., Smith, K.J. & Haight, G.T. (1987). Evaluating health promotion programs in the workplace: behavioral models versus financial models. Health Education Research: Theory and Practice.2, p61-67.

Existentialism, Retrieved June 23, 1999 from Encarta Encyclopedia on-line database, on the World Wide Web: http//encarta.msn.coom/index/conciseindex/0F/00FD4000.htm?z=1&pg=2&br=.

Existential psychology. Retrieved June 23,1999 from World Wide Web: http//oldsci.eiu.edu/psychology/Spencer/Existential.html.

Fahlberg, L.L. & Fahlberg, L.A. (1991). Exploring spirituality and consciousness with an expanded science: Beyond the ego with empiricism, phenomenology, and contemplation. American Journal of Health Promotion, 5, 273-281.

Fischer, J. & Corcoran, K. (Eds.). (1994). Measures for Clinical Practice (Vol. 2). New York: The Free Press.

Frankl, V.E. (1984). Man's Search for Meaning (Rev. ed.). New York, NY: Washington Square.

Gardner, J.W. & Lyon, J.L., (1982). Cancer in Utah Mormon women by church activity level. American Journal of Epidemiology. 116, 1. 258-265.

Garofalo, K. (1994). Worksite wellness: Rewarding health behaviors. Successful program. AAOHN Journal 42, 236-240.

Gebhardt, D.L., & Crump, C.E. (1990). Employee fitness and wellness programs in the workplace. American Psycholgist. 45, 262-272.

Genia, V. (1991). The Spiritual experience index: A measure of spiritual maturity. Journal of Religion and Health. 30, 337-347.

Glasgow, R.E. &Terbog, J.R. (1988). Occupational health promotion programs to reduce cardiovascular risk. Journal of Consulting and Clinical Psychology. 156, 365-373.

Goetzel, R.Z., Kahr, T.Y., Aldana, S.G., Kenny, G.M. (1996). An evaluation of Duke University's live for life health promotion program and its impact on employee health American Journal of Health Promotion. 10, 340-342.

Guralnik, D.B.(Ed.).(1984). Webster's new world dictionary of the American language. New York: Warner Books.

Hall, T.W., Tisdale, T.C. & Brokaw, B.F., (1996). Assessment of religious dimensions in christian clients: A review of selected instruments for research and clinical use. Journal of psychology and theology. 395-421.

Hatch,R.L., Burg, M.A., Naberhaus, D.S., & Hellmich, L.K. (1998). The spiritual involvement and beliefs scale: Development and testing of a new instrument. The Journal of Family Practice, 46, 476-486.

Harvey, M.R., Whitmer, R.W., Hilyer, J.C., & Brown, K.C. (1993). The impact of a comprehensive medical benefit cost management program for the city of Birmingham: Results at five years. American Journal of Health Promotion. 7, 296-303.

Haughie, G. E. (1993). Corporate wellness programs: Are they a cost-effective benefit? Pension World.49, 14-15.

Hawks, S.R., Hull, M.L., Thalman, R.L., & Richins, P.M. (1995). Review of spiritual health: Definition, role, and intervention strategies in health promotion. American Journal of Health Promotion. 9, 371-378.

Heirich, M. (1989). Making stress management relevant to worksite wellness. Advances, Institute for the Advancement of Health. 6, 55-60.

Hiatt, J.F. (1986). Spirituality, medicine, and healing. Southern Medical Journal, 79, 736-743.

Hixson, K.A., Gruchow, H.W., & Morgan, D.W. (1998). The relation between religiosity, selected health behaviors, and blood pressure among adult females. Preventive Medicine. 27, 545-552.

Holm, C.J., Frank, D.I., & Curtin, J. (1999). Health beliefs, health locus of control, and women's mammography beavhior. Cancer Nursing. 22, 2. 149-156.

Ingersoll, R. E. (1998). Refining dimensions of spiritual wellness: A cross-traditional approach. Counseling and Values. 42. 156-165.

Jarvis, G.K. & Northcott, H.C. (1987). Religion and differences in morbidity and mortality. Social Science and Medicine. 25, 7. 813-824.

Jenkins, R.A. & Pargament, K.I. (1995). Religion and spirituality as resources for coping with cancer. Journal of Psychosocial Oncology. 13, 1/2. 51-74.

Jöreskog, K.G. & Sörbom, D. (1996). PRELIS 2: Users reference guide. Chicago, IL: Scientific Software.

Kaplan, M.1996, June 24). Ambushed by spirituality. Time, 62.

Kass, J.D., Friedman, R. Leserman, J. Zuttermeister, P.C. & Benson, H.(1991). Health outcomes and a new index of spiritual experience. Journal for the Scientific Study of Religion. 30, 203-211.

Kim, J., Heinemann, A.W., Bode, R. K., Sliwa, J., & King, R.B. (2000). Spirituality, quality of life, and functional recovery after medical rehabilitation. Rehabilitation Psychology. 45, 4. 365-385.

King. D.G. (1990). Religion and health relationships: A review. Journal of Religion and Health. 29, 101-112.

Kizer, K.W., Folkers, L.F., Felten, P.G., & Neimeyer, D. (1992). Quality assessment in worksite health promotion. American Journal of Preventative Medicine. 8, 123-127.

Koenig, H.G. (1994). Religion and hope for the disabled elder, in Levin, J.S. (ed.): Religion in Aging and Health: Theoretical Foundations and Methodological Frontiers. Thousand Oaks, CA: Sage pp 18-51.

Koenig, H.G. & George, L. (1998). International Journal of Psychiatry in Medicine. 28, 189-213.

Larson, D.B., Wood, G.G., & Larson, S.S. (1993). A paradigm shift in medicine toward spirituality. Advances: The Journal of Mind-Body Health, 9, 39-49.

Levin, J. (2001). God, Faith, and Health: Exploring the Spirituality-healing Connection. New York: John Wiley & Sons.

Levin, J.S. (1993). Esoteric versus exoteric explanations for findings linking spirituality and health. Advances, The Journal of Mind-Body Health, 9, 54-56.

Levin, J.S., Larson, D.B., & Puchalski, C.M. (1997). Religion and spirituality in medicine: Research and education. JAMA, 278, 9. 792-793.

Levin, J.S. & Vanderpool, H.Y. (1987). Is frequent religious attendance really conducive to better health? Toward an epidemiology of religion. Social Science and Medcine. 24, 7. 589-600.

Little, R.J.A. & Rubin, D. B. (1987). Statistical analysis with missing data. New York: Wiley.

McAllister, R. & Broeder, C.E. (1993). Wellness strategies help workers adopt healthy habits in lifestyles. Occupational Health and Safety. 62, 50-54.

McBride, J.L., Arthur, G. Brooks, R. & Pilkington, L. (1998). The relationship between a patient's spirituality and health experiences. Family Medicine. 30, 122-126.

McGuire, M.B. (1993). Health and spirituality as contemporary concerns. ANNALS, AAPSS, 5, 144-154.

McKee, D.D. & Chappel, J.N. (1992). Spirituality and medical practice. Journal of Family Practice, 35, 205-208.

Martinelli, A.M. (1999). An explanatory model of variables influencing health promotion behaviors in smoking and nonsmoking college students. Public Health Nursing. 16, 4. 263-269

Maynard, R. (1997). A wellness programs bottom-line benefits. Nations Business. 85, 9.

Murphy, G.C., Foreman, P.E., Simpson, C.A., Molloy, G.N., & Molloy, E.K. (1999). The development of a locus of control measure predictive of injured athlete adherence to treatment. Journal of Science Medicine and Sport. 2, 2 145-52.

Naas, R. (1992). DuPont links wellness program to reduced absenteeism. Business and Health. 10,19.

Natiello, T. (1986). The management of successful corporate wellness programs requiring the interrelationship of epidemiological and behavioral management. International Journal of Biosocial Research. 8, 61-70.

Oleckno, W.A. & Blacconiere, M.J.(1991). Relationship of religiosity to wellness and other health-related behaviors and outcomes. Psychological Reports. 68, 819-826.

Osman, J.D. & Russell, R.D. (1979). The spiritual aspects of health. The Journal of School Health, 359.

Pelletier, K.R. (1993). A review and analysis of the health and cost-effective outcome studies of comprehensive health promotion and disease prevention programs at the worksite: 1991-1993 update. American Journal of Health Promotion. 8, 50-62.

Perrin, K.M. & McDermott, R.J. (1997). The spiritual dimension of health: A review. American Journal of health Studies, 13, 90-98.

Ratner, P.A., Johnson, J.L., & Jeffrey, B. (1998). Examining emotional, physical, social and spiritual health as determinants of self-rated health status. American Journal of Health Promotion. 12, 4. 275-282.

Riley, B.B., Perna,R., Tate, D.G., Forchheimer, M., Anderson, C., and Luera, G. (1998). Types of spiritual well-being among persons with chronic illness: Their relation to various forms of quality of life. Archives of Physical Medical Rehabilitation. 79, 258-264.

Ritter, T. (1997). Religious influences on well-being. Unpublished manuscript, University of North Texas, Denton, TX.

Rotter J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80 (1, Whole No. 609).

Ruesch, A.C. & Gilmore, G.D. (1999). Developing and implementing a healthy heart program for women in a parish setting. Holictic Nursing Practice. 13, 4. 9-18.

Ryan, R.S., & Travis, J.W. (1981). The Wellness Workbook. Berkley: Ten Speed Press.

Ryckman, R.M. (1989). Theories of Personality (4th ed.).California: Brooks/Cole Publishing Company.

Scherr, M.L., & Tainter, P.M. (). Health promotion in the workplace: The Sheppard experience. The Psychiatric Hospital.13, 92-94.

Seaward, B.L. (1995). Reflections on human spirituality for the worksite. American Journal of Health Promotion, 9,165-168.

Seidl, L.G. (1993). The value of spiritual health. Health Progress, September, 48-50.

Shafranske, E. & Maloney, H.N. (1990). Clinical psychologists' religious and spiritual orientations and their practice of psychotherapy. Psychotherapy,27, 72-78.

Sheppard, R.J. (1989). Exercise and employee-wellness initiatives. Health Education Research: Theory and Practice, 4, 233-243.

Sloan, R.P., Bagiella, E. & Powell, T. (1999). Religion, spirituality, and medicine. Lancet. 353, 664-667.

Smith, K.J. Everly, G.S. & Haight, G.T. (1990). An empirical analysis of the impact of a corporate health promotion intervention on reported sick leave absenteeism. Benefits Quarterly. VI, 37-45.

Sobel, D.S., (1995). Rethinking medicine: Improving health outcomes with cost-effective psychosocial interventions. Psychosomatic Medicine. 57, 234-244.

Spillman, M.A. (1988). Gender differences in worksite health promotion activities. Social Science Medicine. 26, 525-535.

Stahlman, S. (1992). Defining Mysticism: Commentary on Abraham Maslow's "Religious aspects of peak-experiences" Retrieved June 23, 1999 from the World Wide Web: http://www.well.com/user/elliotts/smse_maslow.html.

Tabachnick, B.G. & Fidell, L.S. (1989). Using Multivariate Statistics. New York: HarperCollins College Publishers.

Thomason, C.L. & Brody, H. (1999). Inclusive spirituality. The Journal of Family Pracitice, 48, 96-97.

Waite, P.J., Hawks, S.R., & Gast, J.A. (1999). The correlation between spiritual well-being and health behaviors. American Journal of Health Promotion. 13, 159-162.

Waldfogel, S. (1997). Spirituality in medicine. Complementary and Alternative Therapies in Primary Care. 24, 4. 963-976.

Webster's New Twentieth Century Dictionary. (1983). New York: Simon and Schuster.

Weiss, C. (1996, June 24). Faith and healing. Time, 58-68.

Williams, L. (1998). The relationship of intrinsic spirituality with health status and symptom interference. Unpublished manuscript, University of North Texas, Denton.

Witte, K. (1993). Managerial style and health promotion programs. Social Science Medicine. 36, 227-235.

World Health Organization. (1946, June 19-July 22). International Health Conference. New York, N.Y.

Wurtele, S.K., Britcher, J.C. & Saslawsky, D.A. (1985). Relationships between locus of control, health value, and preventive health behaviors among women. Journal of Research in Personality, 19, 271-278.